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November 8, 1945

Midwest Reports Paper Demand is Strong

Shortages In Many Types of Paper Continue To Worry Mills and Distributors — Waste Paper Collections Declining Far Below Demand—American Paper Goods Co. Expands—Other Market News.

CHICAGO, Ill., November 4, 1945—The Chicago trade noted no particular change in the supply, demand and price status in this area during the week just passed. Demand continues very strong but shortages in all lines continue to exist as predicted. The industry is doing its share of worrying, along with all lines of trade, as to the extent to which it may be asked to go to absorb higher wage increases in the price of the finished product. It is also hoping for early adjustment of pricing problems.

Representatives of the newsprint trade are showing great interest in the study of operating costs of newsprint producers now being made by the OPA. All the trade wonders if this study will determine whether or not a price increase is required and believes that the final results may have some definite effect on the position of the entire paper trade. The study has been under way for two or three weeks with results expected daily. If any increase in price is granted it is expected to apply to imported as well as to domestic newsprint.

Waste paper collections in the city continue to lag far behind demand though professional paper operations are going along at a good rate. The "let down" following V-J Day continues to give the trade real concern.

McGregor Co. in New Location

The McGregor Paper Company of Chicago, has recently moved to a new location at 1400 West Adams street. The quarters were formerly at 412 S. Wells street. The new headquarters is larger, better equipped and more advantageously located. The new telephone number is Monroe 2454.

W. C. Granville Joins Container Corp.

Watler C. Granville, well known color technologist, has recently joined the staff of the Container Corporation of America as a member of its color laboratories division. He has an exceptionally fine background of experience in measurement and color control and is expected to contribute materially to the solution of technical problems arising in carton printing processes and in the making of coated board.

Am. Paper Goods Expands

The American Paper Goods Company has begun construction of a new plant to house the midwest operations of that company according to C. O. Edgerly, vice-president and Chicago manager of the organization which is well known in the paper converting field. The new plant is to be a one story building to be located at 4701 Foster avenue. It is being especially designed by the Austin Company, engineers and builders, to accommodate new high speed presses and machinery for the production of ice cream containers, beverage cups, specialty bags and other products.

New Eaton Display Center Opened

A room especially designed to portray the quality and appearance of its new lines, has been built by the Eaton Paper Corporation at its new Chicago offices at 6 North Michigan avenue. All new display fixtures are designed for the showing of letter papers and are made of bleached walnut, providing an interesting and effective contrast in product and display background. The side wall fixtures in the offices have special cases with fluorescent lighting for the showing of promotional fashion items. Fluted glass partitions separate the showroom from the office area. All office equipment is in the same wood as the display fixtures.

Edward Rohrs is in charge of the new Chicago offices with Miss Lillian Freeman as his assistant.

To Form New Paper Firm

A new paper company is soon to be formed, through a partnership between father and son, with the opening of the Strang and Son Paper Company, 5900 N. Paulina street. The two partners are Frank Strang, former vice-president of the Paper Service Company, and Melvin Strang, son, now with the Marines.

K-C Marks Ten Years: No Accidents

NIAGARA, Wis., October 18, 1945—A decade without a lost-time accident was celebrated by a dinner at which approximately fifty employees in the Groundwood department of Kimberly-Clark's Quinnesec Mill were entertained recently. The department has been without an accident since October 8, 1935. Ceremonies were held in the main diningroom of the Kimlark Inn where the guests were greeted by a miniature groundwood grinder, flanked by flowers, and by a galaxy of speakers and congratulatory letters.

Among those who spoke at the dinner were Gordon Mortensen, Neenah, director of safety for Kimberly-Clark; W. H. Swanson, Neenah, staff head of pulp departments; J. C. Simonich, Neenah, acting director of industrial relations; A. C. McIntyre, superintendent of the record-holding department, and R. J. Wells, mill manager.

Quebec Mills Benefit by Additional Power

Conversion to Peacetime Production Having Marked Effect on Pulp and Paper Industry, Particularly in Newsprint—Americans Purchasing Paper Securities — More Paper Curbs Are Lifted.

MONTREAL, Que., October 29, 1945—The fact that production facilities in Canada, which for the past six years have been geared to war, are now in process of pronounced curtailment or conversion to peacetime uses, is having a markedly beneficial effect on the pulp and paper industry in the matter of power supply. Prior to the war this industry had long been the largest single user of hydro-electric power; in fact, the tremendous development of this industry, and particularly its preeminence in the manufacture of newsprint, never would have been possible but for the abundant sources of hydro-electric power available at its mill sites.

During the war years large amounts of hydro-electric energy had to be diverted from use in pulp and paper mills to war uses, and this was particularly the case in the province of Quebec, from which more than half of Canada's newsprint tonnage now emanates, and in which, during the war, the gigantic war production of aluminum was centered, calling for every available unit of hydro-electric energy that could be obtained.

One result was that power for the pulp and paper industry had to be severely rationed, and the industry's extensive use of hydro-electric current as secondary power for raising process steam had to be abandoned. With the release of this power from special war purposes, hydro energy is now freely available to the pulp and paper industry, and its use for secondary purposes is being resumed, with consequent increase in efficiency of operation and relief in the matter of fuel supplies for steam-raising purposes.

According to official figures from Ottawa, some two million horsepower of new generating capacity was added to the Dominion's developed water power resources during the war. Canada's total available water power resources are estimated to have a capacity of 25,400,000 h.p. under conditions of ordinary minimum flow, with 39,500,000 h.p. ordinarily available for six months of the year. By the end of the present year developed water power will total about 10,300,000 h.p. As it has been found feasible in commercial practice to provide installation up to 30% in excess of the power available at six months' flow, the presently-recorded water power resources will permit a total turbine installation of more than 55,350,000 h.p. That is, the present installation represents about 19% of the possible development.

Quebec, which is without coal resources, has the largest available resources in water power, and with an installed capacity of more than 5,800,000 h.p., has achieved the greatest development. In central and southern Quebec, where the pulp and paper industry is concentrated, there are large water powers still available for development within economic transmission distance of the principal cities and industrial centers on such rivers as the St. Lawrence, St. Maurice, Ottawa and others, whilst great resources await development in the more remote parts of the province on rivers tributary to the St. Lawrence, the Gulf and in Hudson Bay and James Bay drainage.

F. G. Coburn, president of the Brown Company at La Tuque, Que., and Berlin, N. H., in an interview in Montreal, said that the trade winds of pulp and paper development in North America are blowing strongly toward the province of Quebec. While more than half the newsprint tonnage produced in Canada is already being made in Quebec, he looks for a further increase. The chief reasons for this view are, he says, a reliable supply of pulp-making woods, contiguous to abundant water powers, and convenient rail or ship haul to the United States.

Pointing out that the woodlands represent a raw material that can rapidly be diminished by fire and careless exploitation, he said that at the same time they offer the cheering possibility of constant increase in quantity and quality. These remarks were all directed to a strong appeal for forest conservation.

"The people of Quebec," he said, "are at once the owners of the Crown forests and the beneficiaries of the wood-using industries that employ more men and distribute more wages than any other industry in the province. This dual relationship makes every citizen an intimate partner in forest conservation, and it is one of the most encouraging signs of the times that Quebec's population is rallying to forest fire prevention and the great objective of permanent forests."

Heavy Loss of Pulpwood

A fire which raged through the pulpwood pile of the Brompton Pulp and Paper Company at East Angus, Que., for three days last week was finally brought under control, and it is estimated that approximately 15,000 cords of pulpwood were saved. The pile represented the supply of the company's mill at that point for the coming winter, and until it is known how much additional wood can be obtained, the company announces that it will be impossible to state what rate of operations can be maintained over the next six months. Meanwhile full operations are being resumed, and will continue on a full-time basis for some weeks, after which the rate of operations may be reduced to conform to the amount of pulpwood which it is possible to obtain monthly.

Officials state, however, that the company's big new Red Rock mill in Ontario will come into operation this week and that as a result no delays will be caused in deliveries to customers, and that, even with possible curtailed operations at East Angus, the company will, after December 1, have greater production of kraft board and paper available.

More Paper Curbs Lifted

The Prices Board has announced the lifting of weight ceilings on paper used in the manufacture of writing tablets and stenographer's notebooks, implemented as a war conservation measure. The announcement said revoking of the order probably would see writing tablets and notebooks of heavier weight paper when stocks of raw materials become available.

The lifting of restrictions on the mailing of newspapers overseas, in force since August, 1942, has also been announced.

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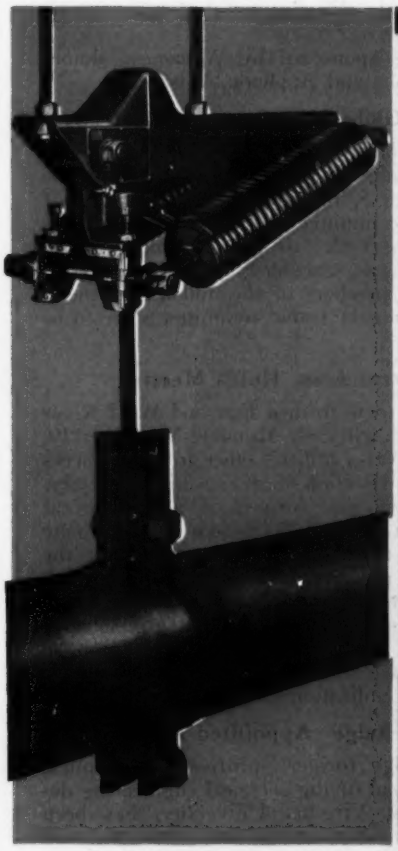

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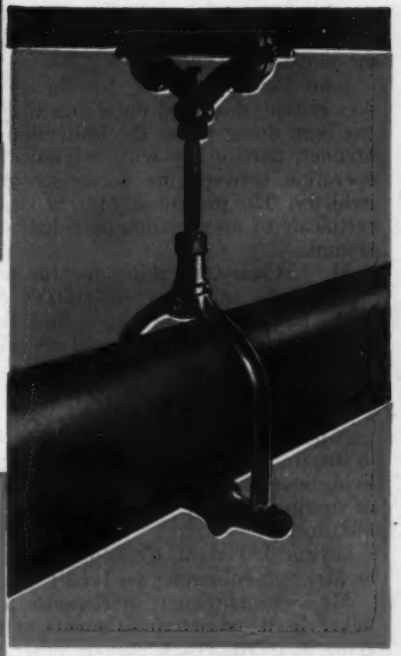

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News of the Wisconsin Paper Industry

Fox River Paper Co. Expands Office Building—F. J. Sensenbrenner Honored At Testimonial Dinner — Badger-Globe Mill Commended By OPA — Talks On Human Factor In Accidents — Other News.

APPLETON, Wis., November 5, 1945—Concrete footings were poured last week for an addition to the Fox River Paper Corporation's office in this city.

The structure, which will cost in excess of $30,000, will be one story, 36 by 52 feet, and is being erected south of the present office building. Both the old and new buildings will be faced with Bedford stone. The main entrance of the enlarged building will be at the southeast corner, with another entrance at the east side. The addition will house private and general offices, including a new reception room.

The work is expected to be completed in about four months. C. R. Meyer Construction Company, Oshkosh, Wis., is the contractor, and Eschweiler and Eschweiler, Milwaukee, Wis., are the architects.

F. J. Sensenbrenner Honored

About 300 persons, among them some of Wisconsin's business, professional and educational leaders, honored F. J. Sensenbrenner, president of the Board of Regents of the University of Wisconsin, at a testimonial dinner Tuesday evening, October 30, at North Shore Golf Club, near Neenah, Wis. Mr. Sensenbrenner retired earlier this year as chairman of the board of Kimberly-Clark Corporation, Neenah.

William E. Schubert, Appleton, vice president and general manager of the Wisconsin Michigan Power Company, was toastmaster. Frank O. Holt, Madison, representing the university in place of President Edwin B. Fred, who was unable to attend, measured Mr. Sensenbrenner by the yardstick by which he said a university measures a regent, pointing to his background of accomplishment and his understanding of the university's needs.

John Berge, speaking for the Wisconsin Alumni Association, discussed the things the board of regents has been doing under the leadership of Mr. Sensenbrenner, particularly with reference to fostering cooperation between the university and business and industry. He presented Mr. Sensenbrenner with a certificate of appreciation on behalf of the Wisconsin alumni.

M. J. Cleary, speaking for the board of regents, spoke of the university's $8,000,000 construction program, emphasized the state's good fortune in having "the experience, judgment and unselfishness of Frank Sensenbrenner to sit in and supervise the expenditure. He said that Mr. Sensenbreener has all the marks of a great citizen.

A personal life that transcends criticism; the ability to inspire confidence in capital, giving jobs with good living standards to thousands of people; the quality of sharing with the public his means, his capacity and his time.

George I. Haight, Chicago attorney, paid a tribute to Mr. Sensenbrenner on behalf of the alumni.

Mr. Sensenbrenner, in response to the testimonial talks, discussed accomplishments of the board of regents in recent years. Among other things, he spoke of the United States Forest Products Laboratory at Madison, which is located at the edge of the university campus because it was hoped that the university would establish a course in pulp and paper chemistry in which the equipment of the laboratory could be used. The university authorities were approached with this idea, but without success. Sixteen years ago, the Institute of Paper Chemistry was established at Appleton, Mr. Sensenbrenner went on, and has since gained a world-wide reputation. It is supported by about 80 per cent of the paper manufacturers of this country, he said.

The dinner was sponsored by Wisconsin alumni of Neenah, Menasha and Appleton, Wis.

Badger-Globe Mill Commended

The Badger-Globe mill of the Kimberly-Clark Corporation, Neenah, Wis., was to receive a certificate Monday, November 5, for efficiency in operation of its transportation committee during gasoline and tire rationing, from the Office of Price Administration. A noon luncheon was scheduled, at which members of the committee, members of the mill management, superintendents, and the traffic committee were to be present.

River Control Assn. Holds Meeting

Directors of the new formed Fox and Wolf River Control Association will meet Monday, November 19, at the Kaukauna, Wis., utilities office to elect officers and to consider the selection of an executive secretary.

The organization was formed at a meeting at Appleton, Wis., on October 27. Its aim is to eliminate springtime Wolf river floods and to stabilize the water of the Fox river for the benefit of industrial, municipal and domestic users.

The executive secretary will collect data preparatory to the formulation of a program which will meet the common objectives of the numerous interests concerned with water utilization in the area.

Dr. W. W. Hodge Appointed Director

Dr. W. W. Hodge, formerly professor of chemical engineering and head of the chemical engineering department of West Virginia University, has been appointed as senior fellow and director of the National Council for Stream Improvement (of the Pulp, Paper and Paperboard Industries) Inc., in charge of the council's multiple research fellowship at the Mellon Institute of Industrial Research at Pittsburgh, Pa.

He will have complete charge of all laboratory and field activities of the Mellon fellowship, which is entering its second year of research in connection with the pulp, paper and paperboard industries' waste disposal and utilization problems. Included among the research groups trying to solve the problems necessary for stream improvement is the Institute of Paper Chemistry at Appleton, Wis.

Discusses Accident Prevention

"The Human Factor in Accident Prevention," was the topic of an address Thursday evening, November 1, in the Menasha, Wis., High School auditorium by Clyde R. Powell, director of personnel and the safety department of the Endicott-Johnson Company at Endicott, N. Y., before more than 400 residents of

(Continued on page 44)

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Canada Releases Newsprint Shipment Data

Current Deliveries Shown At Twice the Rate of Total of Last Year — British Newspapers Criticize Government's Allocation Plan — Paper Freedom Set For March 31 — Other Industrial News.

MONTREAL, Que., November 5, 1945—Due to the lifting of censorship regulations, up-to-date figures covering the whole field in the marketing of Canada's newsprint are now available. These show that current shipments to overseas markets are running at double the total of a year ago, with increases to most of the more than a score of countries to which newsprint is being shipped, the more notable of the increases being to the United Kingdom, Continental Europe and Australia. During the month of September the exports overseas totalled 66,491 tons, as compared with 33,503 tons in September 1944, bringing the total overseas exports for the first nine months of the year to 400,596 tons, as compared with 301,541 tons for the similar period of 1944. Here are the figures as tabulated by the Newsprint Association of Canada from official returns of the movement of newsprint past Canadian customs points:

	September		Nine Months	
Destination	*1945*	*1944*	*1945*	*1944*
United Kingdom	23,955	6,770	88,816	35,013
Eire	1,166	223	7,356	1,300
Continental Europe	3,446	213	39,315	5,259
Mediterranean Area	424	292	3,368	3,195
Egypt	422	624	4,551	6,821
British South Africa	1,734	3,016	14,900	18,529
Other Africa	240	137	4,637	2,205
Br. India, Ceylon & Burma	2,676	1,973	19,452	18,234
Australia	18,714	6,911	57,776	56,012
New Zealand	712	328	16,266	13,226
Argentina	2,609	2,734	30,877	35,319
Brazil	3,390	3,214	37,737	33,217
Uruguay	676	848	10,731	10,077
Other South America	1,812	2,638	20,100	21,990
Mexico	1,437	605	10,832	11,719
Cuba	725	744	10,431	9,368
British West Indies	214	943	3,594	3,672
Other Caribbean Area	1,504	990	10,118	9,569
Others	635	300	9,749	6,816
	66,491	33,503	400,596	301,541
United States	224,865	206,734	1,818,386	1,780,023
TOTAL	291,356	240,237	2,218,982	2,081,564

Paper Freedom Set for March 31

The Prices Board has announced that restrictions on the manufacture of book, writing and specialty papers will be revoked as of March 31 next. The Board's administrator of this paper said that in giving considerable notice of this revocation the intention was to give consuming industries all possible time to prepare their own planning, and that "no additional tonnage of paper will result from the removal of this order." Simultaneous revocation on March 31 of restrictions on the ceiling weights of papers used in the manufacture of envelopes was also announced.

Newsprint in United Kingdom

Dispatches from London are to the effect that the British newspapers have been highly critical of the British Government's decision to allow extra newsprint to book and periodical publishers while continuing wartime restrictions of newsprint to daily newspapers and compelling them to continue the publication of four-page issues. "Already," says one dispatch, "every big newspaper has a redundant staff, which grows daily with men returning from the armed forces." Sir Stafford Cripps, the spokesman in the matter for the Government, is quoted as having told publishers that he regards books as more important than newspapers. It is stated that another meeting with the Government on the question is slated for early in the New Year, at which further representations are to be made regarding the action of the Government in cutting down contracts for delivery of Canadian and Newfoundland newsprint during 1946 from 224,000 long tons to 50,000 long tons. This follows the intimation that the Government would defer "until a later date" considerations as to delivery of the remaining 174,000 tons under the contracts.

Many Woods' Jobs Waiting

R. L. Weldon, chairman of the executive board of the Canadian Pulp and Paper Association, in stressing the importance of the forest industries in Canada's peacetime economy, states that "many thousands of jobs" for the fall and winter months are still awaiting workers in the woods. The pulp and paper industry, he says, needs choppers, teamsters, camp builders, truck and tractor drivers, blacksmiths and cooks. "The pay and the food are excellent," he further says, and "the life is healthy and newcomers will find special facilities for their training." He adds: "In this transition period Canada is depending on her great forest industries to provide employment, to increase foreign trade, and to maintain our national income. The pulp and paper industry needs more woods workers than ever before. We can provide work for every man available, particularly veterans, former war workers and farmers."

As far as the province of Quebec is concerned, a great migration of workers is now under way, attracted by the high rates of pay. Many villages have been almost denuded of able-bodied men who have gone off to the logging shanties far and near, farm after farm being left with only the women and school children to milk the cows, attend to the stock and do the chores. The men will come back in the spring with more money than they ever had before. The Government has set November 15 as the date for removal of all restrictions on the movements of farm workers, and it is hoped that many additional thousands of farm workers from non-forest regions will migrate to the woods.

B. C. Gathers Douglas Fir Cones

VANCOUVER, B. C., October 15, 1945—More than 10,000 bushels of Douglas fir cones are now being harvested on Vancouver Island and in the Fraser Valley of British Columbia by the Provincial Forest Service. Cone-gathers are paid $1 per bushel for green cones and $1.25 per bushel for dry cones. Seeds extracted from the cones go to three forest nurseries and the seedlings are later used in reforestation. During the last three years, the forest service has set 10,000,000 trees annually as its objective, but labor conditions have sometimes prevented this figure being maintained. Some 35,000,000 young trees have been planted since the inception of the reforestation program several years ago, however.

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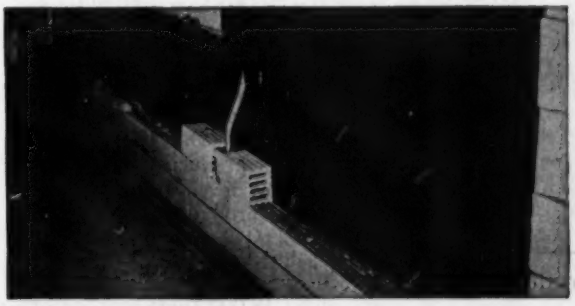

STAYS IN PLACE—In core walls, PC Foamglas becomes an integral part of the structure, can be tied in to brick, tile or other backing and facing. This rigid, cellular glass material does not pack down, slip, warp, or rot—it is damp-proof, verminproof, incombustible.

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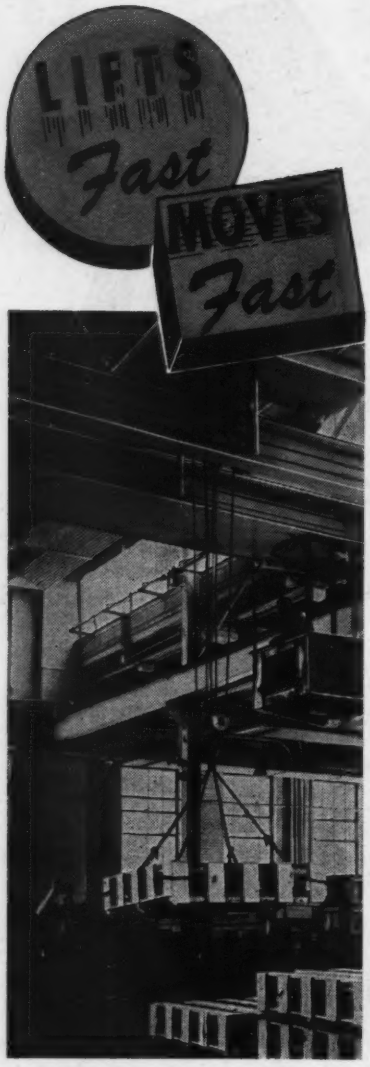

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Pulp Group Meets

WASHINGTON, D. C., November 7, 1945—The nine-man industry advisory committee recently appointed by the Office of Price Administration to represent producers of logs and pulpwood in Minnesota, Michigan and Wisconsin will hold its first meeting with representatives of the price agency in Chicago on November 9, 1945, it was announced today.

Election of a committee chairman and other officers, together with a discussion of the grade rules for logs and pulpwood are the principal matters included in the agenda of the Chicago meeting. Current pricing provisions for producers of logs and pulpwood in Minnesota, Michigan and Wisconsin, referred to in the industry as "the Lake States Area," are provided by Maximum Price Regulation 533-2—Lake States Logs —and Maximum Price Regulation 257—Lake States Pulpwood.

OPA will be represented at the Chicago meeting by James H. Stark and Vincent Martin.

Members of the newly-appointed committee are:

L. L. Anderson, Chatfield, Minn.; George Corrigan, Hurley, Wis.; Victor Makela, Negaunee, Mich.; Earl C. Poundstone, Gogebic Land & Timber Co., Watersmeet, Mich.; Henry Theiler, Alston, Mich.; John Campbell, Jr., Duluth, Minn.; Roy Hedstrom, Grand Marias, Minn.; James Peterson, James Peterson and Son, Hurley, Wis.; H. H. Richmond, Goss and Richmond, Cass Lake, Minn.

Mead Sells Gould Line

The Gould Paper Company of Lyons Falls, New York, has appointed the Mead Sales Company, New York City, as exclusive sales representatives for its groundwood printing and converting sheets. The grades to be manufactured will be sold under the Gould mill brand name.

The Gould Paper Company has for fifty years been a manufacturer of newsprint, but during the past year has been converting to productions of better grades of groundwood specialties, printing, writing and converting papers. The Company has an abundant supply of clean, high-grade Adirondack spruce pulpwood from its own timberlands, and a completely integrated sulphite, groundwood and paper mill at Lyons Falls.

Extensive alterations and changes to the manufacturing plant and equipment are now being made, with the objective of supplying the finest quality of papers from a mill that will be modern in every respect.

Algerian Esparto Available

WASHINGTON, D. C., November 4, 1945—Stocks of Algeria's 1944-45 esparto crop of the quality used in paper manufacture are now available at the official export price of 1,942 francs per metric ton (about $35 per short ton), says a report to the Department of Commerce. The former export price was 936 francs per metric ton (about $17 per short ton), but increased labor and transportation costs have raised the price. Since esparto grass grows wild in Algeria, the price of the product is based almost entirely on the costs for workmen cutting the grass and the cost of transporting it an average distance of fifty miles over bad roads to shipping points. Both labor and transportation facilities are still scarce, and the 1945-46 gatherings will probably be limited unless there is an immediate demand for exports.

The demand for the product largely determines how much grass will be cut during the harvest season from July to February and dried and baled ready for shipment by September. There are no accurate estimates of the amounts available, but there are some reserve stocks left from the war years when exports of esparto were virtually non-esistent.

French Output Low

WASHINGTON, D. C., November 4, 1945—Paper production in France is still at a low level. In 1938 French paper mills produced an average of about 105,000 short tons of paper per month; during the first 6 months of 1945 the average monthly production was about 18,000 short tons, according to a report to the Department of Commerce.

France produced very little wood pulp during June, July, and August, being hampered by a coal shortage, small inventories of domestic pulp wood, and the complete absence of imported pulp wood. In 1939 France imported 250,000 cords of pulp wood, which was 75 per cent of its total consumption.

Fellows at Fitchburg

FITCHBURG, Mass., November 5, 1945—Carl M. Fellows, who has been released from active duty as lieutenant-commander in the U. S. Navy, and who formerly was New England sales manager for the Fitchburg Paper Company, has rejoined the managerial staff of that Company as appointed plant manager in charge of manufacturing and converting at Fitchburg Paper Company and its Decotone Division.

Paper Securities Gain

TORONTO, Ont., November 3, 1945 —Another remarkable gain was scored during the past week by the paper stocks. There was an 11-point rise in the index to 260.71. This represents a rise of about 37% since V-E day, by far the greatest advance registered among the different stock groups. Better labor prospects, an expansive market and possibilities of higher paper prices are the chief bullish factors.

The paper group which has shown a fairly steady upward climb for three years now, shows no sign of a change in direction. The Montreal exchange's average war-time low for paper stocks was 47.92. Compared with the present average of above 260, the group has made a phenomenal recovery. What is sometimes overlooked, however, is that the papers just prior to the outbreak of the war, were selling much higher than even the present levels. The low of recent years was on July 22, 1935, when the paper average dropped to 24.31. Less than two years later, April 5, 1937, the paper average was 374.69.

Vanderlip Takes Brown Line

ADAMS, Mass., November 2, 1945 —The F. A. Vanderlip Company of Hartford, Conn., has been appointed a distributor in that area of L. L. Brown's Linen Ledger, Greylock Ledger, Escort Ledger and Machine Posting, Resistall Linen Ledger and Resistall Index Bristol, all products of the L. L. Brown Paper Company. The new distributor is arranging to carry representative and adequate stocks of various items in these well-known papers.

Brompton Starts at Red Rock

TORONTO, Ont., November 4, 1945 —Operations at the Red Rock, Ont., mill of Brompton Pulp and Paper Company, are just getting started, but are still in the growing pains stage, and it is not possible at present to estimate how much production at this mill will compensate the company for the reduced production at their East Angus plant in Quebec owing to a recent fire which destroyed much pulpwood, according to officials.

Dynes Joins H & W

BOSTON, Mass., November 5, 1945 —Charles J. Dynes has joined the Hollingsworth and Whitney Company. He will make his headquarters at the Boston office, 60 Batterymarch street. Mr. Dynes has been on leave of absence from the Sorg Paper Company to serve with the War Production Board. His resignation as Deputy Director of the Paper Division was effective on October 31, 1945. It is expected that he will assume his new duties early in November.

Fete Vail's 40 Years

PHILADELPHIA, October 20, 1945 —James G. Vail, Vice-President and Director of the Philadelphia Quartz Company, manufacturers of silicates of soda, recently celebrated 40 years of continuous service with the Company. His fellow directors and associates tendered a testimonial luncheon in his honor at the Downtown Club in Philadelphia.

APPA to Meet February 24

The annual meeting of the American Paper and Pulp Association has been scheduled for February 24-28, 1946, at The Waldorf-Astoria, New York. Unless travel and hotel congestion have been considerably relieved by that time, it is hoped that attendance can be limited to those having business at the meeting. The Waldorf will have no sleeping rooms available for assignment.

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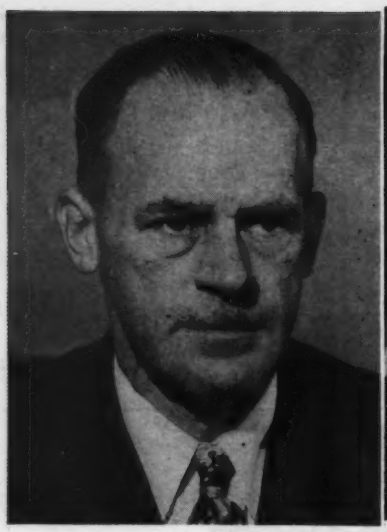
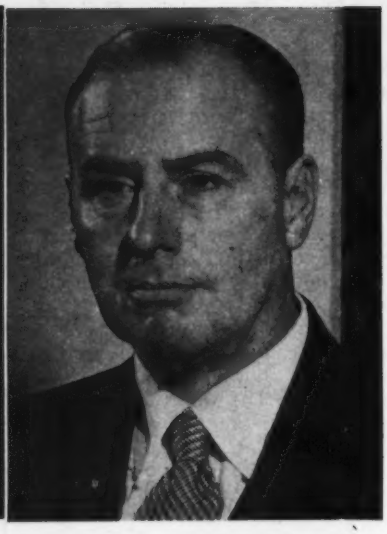


H. S. DANIELS

W. E. NICHOLSON



DONALD J. HARDENBROOK

Union Bag Advances Three

H. S. Daniels, formerly vice-president in charge of sales, has been elected executive vice-president of the Union Bag and Paper Corporation, succeeding H. P. Carruth, who has resigned to enter private business as a consultant. Mr. Carruth will give his entire time to Union Bag in an advisory capacity for several months, and it is expected that he will continue in that capacity on a part-time basis. He will remain as a director of the company. Mr. Daniels, with Union Bag since 1919, was elected vice-president in charge of sales in 1933 and director in 1934.

Two additional promotions were made at the same time by Alexander Calder, president of the company. G. W. E. Nicholson, former resident manager of the Union Bag's Savannah plant, was named vice-president in charge of manufacturing. Donald J. Hardenbrook, formerly assistant to the president was elected vice-president in charge of industrial and public relations and woodlands.

Cancell Joins Powell River

VANCOUVER, B. C., November 5, 1945—Benton R. Cancell has now been appointed vice-president in charge of operations at the Powell River Company and will have his headquarters at the Vancouver office of the firm. Mr. Cancell has resigned from the post of director of the forest products bureau of the War Production Board at Washington, D. C. Mr. Cancell, whose home is in Larchmont, N. Y., was with the St. Regis Paper Company of New York City before joining the W.P.B. in 1943.

Hooker Opens New Laboratory

NIAGARA FALLS, N. Y., November 5, 1945—The Hooker Electrochemical Company has opened a new Physical Research laboratory to provide physical analyses and controls for all phases of chemical work at Hooker. Application of physical controls to research, development, and production are under way at the present time. The types of work include infra-red and ultra-violet spectroscopy. The new laboratory is under the direction of Dr. L. J. Brady, formerly a Fellow at the Mellon Institute of Industrial Research.

Expects Less Newsprint in December

WASHINGTON, D. C., November 7, 1945—Because of accumulated over-orders for the fourth quarter, a reduction of 15% in newsprint orders for December delivery can be expected, publishers in the United States were warned today by the War Production Board.

WPB has been informed by the Newsprint Administrator of Canada that orders from U. S. customers for shipment in November are more than 240,000 tons—10,000 tons over the monthly allocation of 230,000 tons for this country. And to this must be added whatever tonnage is specified for the armed forces and liberated countries, which is estimated at about 2000 tons.

Since orders in October were also about 10,000 tons over allocation, WPB is calling the attention of U. S. publishers to the fact that the accumulated over-orders are now around 20,000 tons. If orders for December delivery continue to exceed allocation at the rate established in October and November, cancellation of the 30,000 tons of over-orders will be necessary in December.

By agreement with the Newsprint Administrator of Canada, WPB is required to cancel on December 1 all over-orders accumulated in the fourth quarter of 1945 to assure that the total of all orders does not exceed 690,000 tons.

WPB stated that it is the responsobility of the publisher to budget his paper so as to make it last for the fourth quarter of 1945 and thereafter and pointed out that no government agency guarantees delivery of paper allowed under a publisher's delivery quota as that is a matter between the publisher and his supplier.

Boston Trade to Dine Nov. 14

BOSTON, Mass., November 5, 1945—At the Fall Meeting and Dinner of the Boston Paper Trade Association, to be held November 14 in the Roof Ball Room of the Parker House, Dr. Henry Gerald is to be the speaker. His subject is "Psychology and Laughter." The membership committee has approved 19 applications.

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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending November 3, 1945

STOCKS

	High	Low	Last
A. P. W.	9	7	9
Armstrong Cork Co.	58¼	55⅜	57½
Celotex Corp.	20	19	19¾
Celotex Corp., pf.	21	20½	21
Certain-Teed Products Corp.	15⅛	14⅜	14⅝
Certain-Teed Products Corp., pf.	108½	108½	108½
Champion Paper & Fibre Co.	46½	44¼	46½
Champion Paper & Fibre Co., pf.	110½	109¼	110½
Congoleum Nairn Co.	35½	34¼	35½
Container Corp. of America	36½	35	36½
Continental-Diamond Fibre Co.	16⅞	14¾	16¾
Crown-Zellerbach Co.	30	28⅞	30
Crown-Zellerbach Co., pf.	119	117⅞	119
Dixie Cup Co.	42½	38	42
Dixie Cup Co.,—A	51¼	50	50¾
Flintkote Co.	32⅞	31⅛	32¼
Flintkote Co., pf.	109½	109	109½
Robert Gair	9¼	8	9¼
Robert Gair, pf.	19⅜	18¾	19⅜
International Paper Co.	42⅝	39⅛	42½
International Paper Co., pf.	114	109¾	114
Johns-Manville Corp.	141	138	141
Johns-Manville Corp., pf.	133½	131½	133½
Kimberly-Clark Corp.	58½	54⅝	58½
Mac Andrews & Forbes	35½	35½	35½
Mac Andrews & Forbes, pf.	153½	153½	153½
Masonite Corp.	54¼	50½	54¼
Mead Corp.	21½	20	20¾
Mead Corp., pf. A—6%	106½	106	106
Mead Corp., pf. B—5½%	105	105	105
National Container Corp.	26¼	22½	26¼
Paraffine Companies, Inc.	...	...	...
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	23½	22¼	23¼
Rayonier, Inc., pf.	37¾	37½	37½
Ruberoid Co.	47	46	46¼
Scott Paper Co.	61¼	55	61
Scott Paper Co., pf.	111	109¾	109¾
Sutherland Paper Co.	39¾	38½	39¾
Union Bag & Paper Corp.	26⅜	24½	25
United Paperboard Co.	9⅜	8¾	9¼
U. S. Gypsum Co.	103⅜	100¼	102¼
U. S. Gypsum Co., pf.	...	...	...
West Virginia Pulp & Paper Co.	35½	34¼	35½
West Virginia Pulp & Paper Co., pf.	...	...	...

BONDS

Abitibi Pulp & Paper Co. 5s '53	109	107¼	109
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '53	...	...	...
Champion Paper & Fibre Co. 3s '65	103	103	103
International Paper Co. 6s '55	109	108½	108¾
International Paper Co. 5s '47	104	103	103
Mead Corp. 3½s '53	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending November 3, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	44½	44	44
Hummel-Ross Fibre Corp.	10¾	9⅞	10¾
St. Regis Paper Co.	10	9⅛	10
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	9⅛	8½	9

BONDS

American Writing Paper Co. 6s '61	101	101	101

Celotex to Increase Directorate

Celotex Corporation stockholders will meet in Chicago November 20 to vote on a proposal to increase the board of directors from nine to eleven members. The proposed new directors are Albert C. Simonds, Jr., vice president of the Bank of New York, and Parrish Fuller, Louisiana lumberman. Stockholders also will decide whether to divide directors into three classes, with about one-third to be elected each year for three-year terms, and whether to adopt an amended certificate of incorporation keyed to expanding business.

Container Corp. Nets $1.79

The Container Corporation of America for the nine months ended September 30, reports net earnings of $1.79 per common share, compared with $2.11 for the like period in 1944. Net sales for the nine month periods totaled $56,494,266 in 1945 and $52,018,987 in 1944.

Robt. Gair Co. Issues Report

The Robert Gair Company and subsidiaries report for the quarter ended September 30, 1945, combined net profit of $139,808 after provision of $188,000 for U. S. federal income and excess profits taxes, equal after preferred dividends to 4.4 cents per share on 1,231,467 shares of common stock.

For the third quarter of 1944 the combined net profit was $188,759 after provision of $376,000 for U. S. federal income and excess profits taxes, equal after preferred dividends to 11.7 cents per share.

The net profit for the first nine months of 1945 after deducting $107,000 for premium on the retirement of the 40-year 6% income notes and $1,470,772 for U. S. federal income and excess profits taxes amounted to $532,923, equal after preferred dividends to 24 and nine-tenths cents per share on 1,231,467 shares of common stock. For the same period in 1944 the net profit was $519,078 after deducting $1,612,000 for U. S. federal income and excess profits tax.

Flintkote Earns Less

The Flintkote Company and subsidiaries for the forty weeks to October 6, reports a net income of $1,115,861, equal to 88 cents each on 1,033,921 common shares, compared with $1,159,163, or $1.09 each on 951,608 shares for 1944 period; net sales, $28,893,869, against $28,717,532. Twelve weeks to Oct. 6: Net income, $332,812, against $397,090 for twelve weeks to Oct. 7, 1944; net sales, $8,641,747, compared with $9,437,985.

Union Bag Nets $1.16

The Union Bag and Paper Corporation for the nine months, reports a net income of $1,472,954, or $1.16 a share, against $1,251,547, or 98 cents a share last year; sales, $31,297,517, an increase of 10% over $28,452,382 volume a year earlier. September quarter: Net income, $425,654, or 34 cents a share, against $456,193, or 36 cents a share for third quarter of 1944; sales, $9,731,189, against $10,028,806.

A. W. P. Corp. Profits Off

The American Writing Paper Corporation for the nine months to September 30, reports a net profit of $108,017, equal to 30 cents a share, against $123,499, or 34 cents a share last year. September quarter: Net profit, $28,582, or 8 cents a share, against $39,301, or 11 cents a share last year.

Scott Co. Earnings Up

The Scott Paper Company and subsidiaries for the nine months, reports consolidated net earnings of $1,079,905, or $1.47 each on 731,332 common shares, compared with $973,226, or $1.45 each on 667,942 common shares last year.

Hinde & Dauch Earns $2.01

The Hunde and Dauch Paper Company and subsidiary for nine months reports a net profit of $846,388, or $2.01 a common share, against $898,757, or $2.12 a common share last year.

Oxford Earns 64 Cents

The Oxford Paper Company for nine months reports a net profit of $623,595, or 64 cents a common share, against $611,860, or 60 cents a share, last year.

Commonplace Essentials loom large among materials on which many modern advances in chemical synthesis depend. Caustic soda, one of the most familiar faces in the chemical family, is typical. For "NaOH" serves in the processing of rayon yarns for fine fabrics, soaps, refined petroleum and vegetable oils, paper making, and in rubber reclamation. Thorough knowledge of such widely used "Commonplace Essentials"... is combined with Niagara's recognized preeminent standards of manufacture to provide users with the dependable source of supply they need.

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A. N. P. A. Evaluates Newsprint Supply

Cranston Williams, general manager of the American Newspaper Publishers Association, made public November 2 the letter going to all daily newspapers which includes text of a telegram sent to 150 of the largest newsprint users in connection with a plan under consideration to balance consumption with the newsprint available in the first six months of 1946.

Complete text of the letter follows:

"WPB Order L-240 limiting the consumption of newsprint expires December 31, 1945 and there will be no government restriction on newsprint consumption after that date.

"It is estimated that the total supply of newsprint available for use in the United States in the first six months of 1946 is 1,935,000 tons. It is estimated that if consumption is based on the tonnage that would be used if all newspapers limit themselves to the tonnage calculated to be the amount provided in the expiring Order L-240, with the sliding scale running from 1% to 6% instead of from 2% to 12% as permitted in the present four quarter, a serious runaway situation can be avoided."

The following telegram has been sent to the 150 largest newsprint users in the United States. This letter is being sent to every daily newspaper not getting a telegram. Please read the telegram carefully and reply to the ANPA just as though the telegram had been sent to you personally:

"Special Newsprint Committee in all-day session canvassed all available information on newsprint supply. Apparent demands are for more newsprint than estimated supply, Figures for first six months 1946 supply indicate slight increase but short of demand. In the Committee's opinion there is but one alternative to a runaway situation after the removal of government control on December 31, 1945. That is a voluntary limitation by publishers of deliveries and consumption during the first two quarters next year. In the light of information available the committee believes that supply will permit consumption and acceptance of deliveries at rates equivalent to allowable use under expiring Order L-240 with sliding scale reduced from 2 to 12% as at present to 1 to 6% for first two quarters next year. To avoid a runaway situation the committee members suggest that all users themselves limit their own consumption and deliveries to that maximum. Our aim in proposing this program is to protect all users both small and large through a voluntary cooperative plan. Will you pledge your support to this program and pledge your newspaper to operate accordingly? We are wiring 150 publishers using largest tonnage asking reply by wire and all other publishers are being sent letters. Your pledge only effective if program generally approved by publishers. Please rush reply."

Maj. Jepson Back With Madden

The Jay Madden Corporation has made known the return from duty with the Army Air Corps of Major Franklin M. Jepson, and the resumption of his activities as vice president of this company. Major Jepson was overseas for three years with the Eighth Air Force. After spending six months with the R.A.F. Intelligence Command, he started and headed up the Photo Intelligence Section of the Eighth Air Force. Lieutenant Commander James H. Madden, now on foreign duty with the Navy, is expected to return in December to resume his former association with this company.

Eagle Lodge Wins Appeal

HOLYOKE, Mass., October 20—Members of Eagle Lodge of Papermakers, No. 1, learned last night of victory attained through an appeal to the War Labor Board in matters under controversy since April on the working contract with the seven local paper manufacturers.

The outcome of a vote of the regional War Labor Board at Boston was flashed to this city by International Organizer Edward Moore of this city and Sixth Vice-President John Jones, both of the International Brotherhood of Papermakers, AFL, who visited the WLB offices late yesterday afternoon to learn the outcome.

The WLB voted the following clauses in favor of the workers: Three holidays with pay; time and a half pay for the sixth day and shift differentials of four and six cents an hour for the middle and last shifts.

There was a panel hearing on July 27 and the recommendations of the panel were received on September 13. These were unfavorable and an appeal was taken to the regional board.

Andrew Beaton, president of Eagle lodge, announced that members of local 226, Holyoke Paper Mill workers, embracing the finishing trades, have been invited to join the local lodge in its next regular meeting to discuss the terms of the WLB vote.

U. S. Trade Surveys Commended

WASHINGTON, D. C., October 29, 1945—"American business and trade surveys made by the Department of Commerce are recognized as the best in the world," according to E. A. Chapman, Bureau of Foreign and Domestic Commerce.

"No other government has any program which approaches the work the United States government is doing to aid its business men, particularly in the field of world commerce," he added.

He cited the growing interest abroad in departmental publications in the foreign trade field. Two recent studies—"The United States in World Economy" and "How to do Business with Russia"—were cited as outstanding examples of this interest; the British government alone requested officially permission to reprint 5,000 copies of the former, and some 30,000 copies of the Russian article have been sold to date for distribution in this country and abroad.

Foreign business men, however, can use the Department's publications only by subscription at prices slightly higher than those charged American business men, it was pointed out.

Mid West Merchants Organize

KANSAS CITY, Mo., October 23, 1945—Nearly 50 National Paper Trade Association members from Iowa, Nebraska, Missouri and Kansas, meeting here voted to form a regional organization under the name of Mid West Paper Merchants Group. An organization committee was appointed which engaged Carl V. Kretsinger of Kansas City as executive secretary and counsel for one year.

Mr. Kretsinger will assume on December 1, duties which are expected to parallel closely the activities and functions of other regional or local secretaries serving the trade. Opportunity will be given to all National Paper Trade Association members in the area to participate in and share the benefits.

Paper Demand Heavy in Indianapolis

INDIANAPOLIS, Ind., November 5, 1945—Little change was noticed in the paper market last week. Manufacturers and jobbers are finding it very difficult to care for current demands and cut down the vast volume of back orders. In fact this backlog is causing the trade more concern than any other factor, unless it is the continued control of prices by OPA. Most of the trade here believes it is about time for OPA to loosen up somewhat on the price situation and there are many who believe there is very little future in the trade as long as prices are so regulated. There is no concern here about demand. It is heavy and will remain heavy for quite some time, but the inability to secure merchandise is causing a lot of concern.

Demand for kraft of all kinds was strong last week with supplies strictly limited. Bag and wrapping paper is scheduled to remain in heavy demand now until after the holidays. Tissues were moving nicely and though there has been some easement in supplies, the volume is not sufficient yet to meet current demand. Cellophane and waxed papers were in a strong position. Makers believe the reconversion will see additional uses developed for these papers.

Mill demand for waste paper continued heavy here last week with collections none too good. Prices were strong at ceiling levels. Rag demand also was heavy, the manufacturers particularly desiring better grades of cuttings.

McGill Succeeds A. R. McCleary

Stein, Hall & Co., Inc., New York, has announced the resignation, effective January 1st, of A. R. McCleary as managing director of its Canadian affiliate, Stein-Hall, Ltd., Toronto, Ont., and the appointment of David McGill as general manager, with E. F. Clark as assistant manager. Mr. McCleary has been connected with Stein-Hall, Ltd. since its inception. Mr. Clark has been purchasing agent and production manager for ten years.

Mr. McGill joined the Canadian Active Army in August 1943 and has been attached to the Army Technical Development Board at Canadian National Defense Headquarters in Ottawa. He completed his Army service as a Major recently and joined Stein-Hall on October 15th.

Born in Manchester, England in 1902, Mr. McGill was graduated from Manchester University in 1922 with a B.Sc. degree in technical applied science. From 1922 to 1926 he was assistant chemist for West Indies Chemical Works, Ltd. of Manchester, and Jamaica, B.W.I., manufacturers of logwood dyestuffs. For the next three years he was chief chemist and superintendent for Wabasso Cotton Co., Ltd., Three Rivers, Quebec. In 1930 he became secretary and director of Industrial Process Development Ltd. and Dye & Chemical Co. of Canada Ltd., Kingston, Ont.

Casein Output Off 16 Per Cent

WASHINGTON, D. C., October 29, 1945—Estimated at 810,000 lbs. for August, dry casein production was not only 16% less than a year ago, but was also the lowest production on record for the month since 1922, the Bureau of Agricultural Economics reports. Stocks of 5,890,000 lbs. of dry casein were held by domestic producers on August 31, a 2% increase from the corresponding date last year. Domestic casein markets were firm but not active in the last week of September.

Tissue Brands List Expanded

The Tissue Association, Inc. recently issued a 35-page supplement of brand names covering kindred tissue products. In addition to being sent to all Tissue Paper Manufacturers, this supplement was also sent to tissue paper merchants, through the cooperation of the National Paper Trade Association, in order to acquaint them with the valuable service rendered by the Label Registration Bureau of the Tissue Association, Inc., 122 East 42nd Street, New York 17, New York. The purpose of the Bureau is to help prevent unnecessary controversy over brand name rights by accumulating as far as possible a complete record of all trade marks used on kindred products, particularly toilet tissue, towels, napkins, facial, sanitary napkins, diapers, lightweight wrapping tissue and other paper products of the same descriptive properties, granted by the U. S. Patent Office or recorded directly with the Bureau. So far, this Bureau has in its records over 8,000 such names, recorded over a period of 25 years. As a result of this service, many duplications and simulations of brand names have been avoided, with consequent savings to the industry.

Reports on Bonded Papers

The use of synthetic resins in paper, to hold the fibers together in an insoluble bond, is discussed by C. G. Weber, of the Bureau of Standards, in a report he prepared recently.

At the Bureau, studies were made during the war, dealing with resin bonding in the manufacture of wet-strength papers for war maps, and resins have been used to give paper better resistance against rough usage when wet, than was hitherto possible.

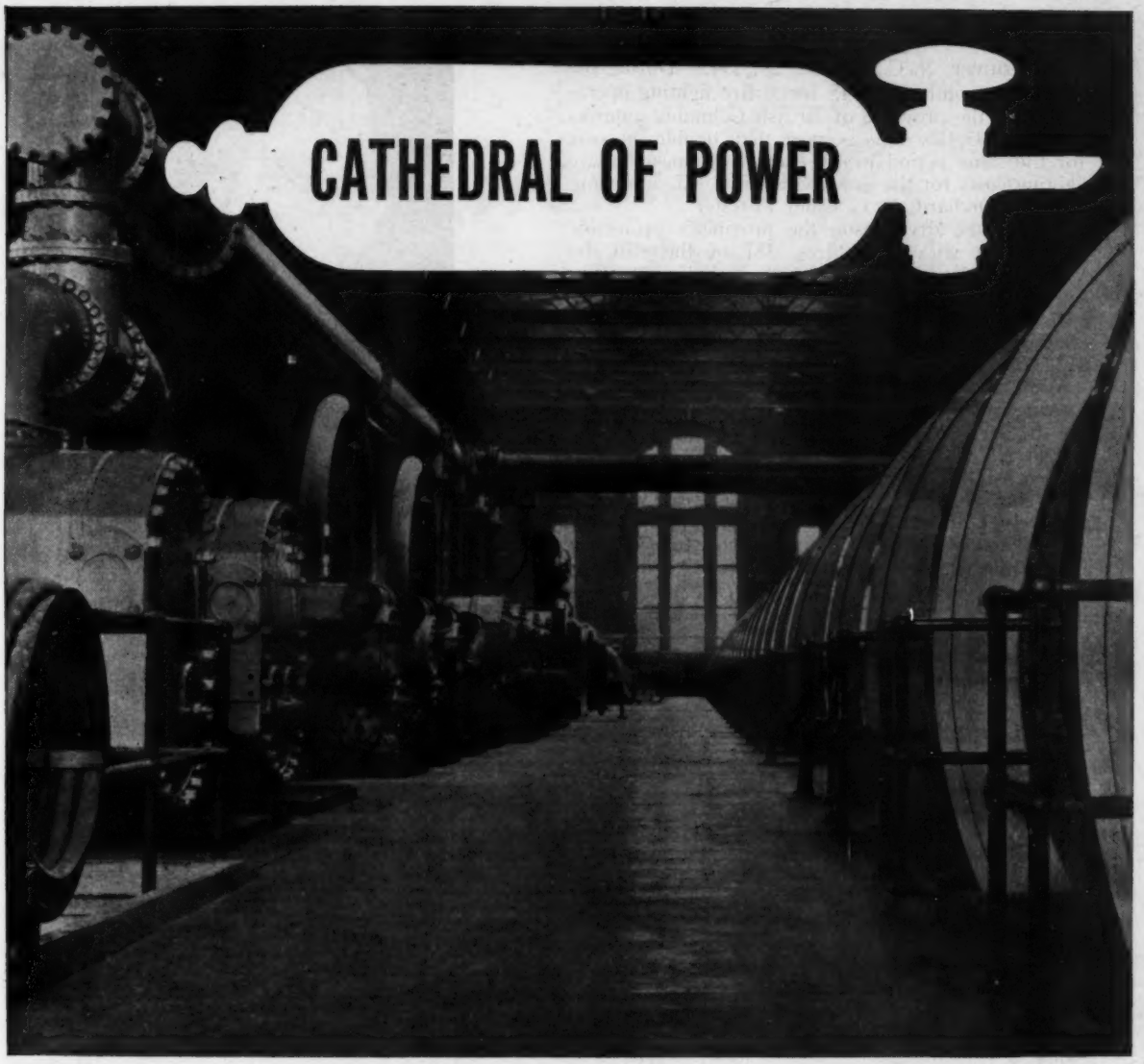
Paper is now being produced that can be successfully laundered with hot water and soap, or cleaned in gasoline or other solvents after having been smeared with mud or grease and oil.

Although resin-bonding has been confined largely to war purposes, the Bureau stated, a start has been made in applying it to civilian paper. It has been employed with important benefits in wrappings, toweling, bags, posters, shipping tags, photographic papers, lens wiping tissues, facial tissues, garbage containers, diaper backing, handkerchiefs, and field notebooks.

The possibility is seen also, according to the Bureau, that the same technic can be used to reduce the tendency of printing papers to alter their dimensions, curl, wave and buckle in response to changes in the weather.

Yunker Joins Foxboro Staff

FOXBORO, Mass., November 1, 1945—The Foxboro Company, maker of industrial instruments for measurement and control, has added Ward S. Yunker to the home office staff as assistant manager of the Fiber Industries Sales Division, specializing in instrument engineering for the pulp and paper industry. Mr. Yunker's past connections include the Great Northern Paper Co., the Paper Insulated Wire Division of the Western Electric Co., and the Roofing Products Division of the Flintkote Co. At Middlebury College, where he had majored in industrial chemistry, he graduated with the degree of BS. He then took a position in the Forest Products Laboratory of Department of Agriculture, at the University of Wisconsin, and followed this with post-graduate work at the Institute of Paper Chemistry, at Appleton, Wis.



• *Compressor room, North Plant, Wyandotte Chemicals Corporation, Wyandotte, Michigan. Heart of the processing operations, source of power, gas and air compression, vacuum, and pumping requirements of the North Plant, its shops and salt wells. Here originates power used to transform salt, limestone and coal into alkalies and chemicals.*

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Fires Costly in British Columbia

VANCOUVER, B. C., October 29, 1945—During the first eight months of 1945 forest fire fighting operations cost the province of British Columbia approximately $285,416. This is more than double the cost for the same period in 1944 and ten times the fire fighting costs for the same period in 1943, according to C. D. Orchard, B. C. Chief Forester.

During the dry season the province's protective crews dealt with 1,797 fires, 381 of them in the Vancouver forest district, which includes all Vancouver Island.

In 1944, during the same period, the department's crews fought 1,678 blazes at an estimated cost of $122,008.

With better weather conditions throughout the province in 1943 than average, fire fighting costs during the dry season were estimated at $28,460. Crews fought 1,148 blazes.

Most of the fires which were responsible for the high cost of forest fire fighting this year were in the Nelson district.

Breakdown of the total estimated cost for this year with similar statistics for 1944 in brackets follows:

Vancouver, 381 fires, $37,068 (478, $28,826); Prince Rupert, 84 fires, $2,296 (61, $4,006); Fort George, 177 fires, $27,800 (210, $41,000); Kamloops, 543 fires, $28,779 (392, $12,975), and Nelson, 612 fires, $189,473 (537, $35,201).

Commerce Dept. to Modernize

WASHINGTON, D. C., November 4, 1945—An ambitious postwar modernization of the Department of Commerce, with the announced purpose of making it more valuable to business and industry has been proposed by Secretary of Agriculture Wallace.

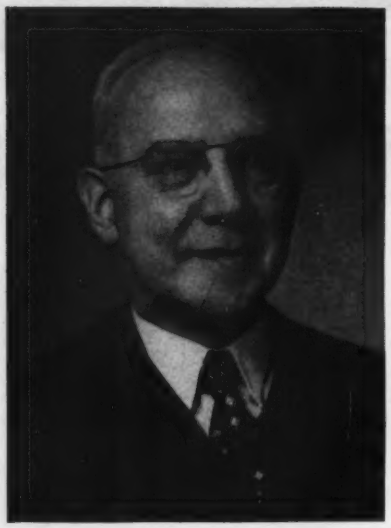
A departmental summary of the program includes the following; a revitalized foreign trade service, to be more effective, in cooperation with the State Department, in formulation of commercial policy and to promote a high level of foreign trade on a sustained basis; a strengthened statistical and business intelligence service; a broad analytical program to give business and industry current information on the economic situation and business outlook; technological aids to business, especially small business; management aids to business, especially looking to small business needs; a greatly expanded technical service.

The plan calls for three new assistant secretaries of commerce, who would head special services under the general program.

It is especially geared, the Department emphasized, to assist in building up foreign trade, import and export, by keeping American business informed as to markets abroad, firms abroad engaged in specific lines, and other such services.

More Paper Released to Switzerland

WASHINGTON, D. C., October 29, 1945—The ration of newsprint in Switzerland, reduced on May 1, 1945 to 60% of normal consumption, has been raised for certain classes of users, says a report to the Department of Commerce. Newspapers with a medium circulation are now being allowed 70% of their normal consumption, and those with a small circulation, 80%. The larger newspapers, however, still get no more than the 60% allotment. More paper is being released for the packing of foodstuffs and the printing of books.



WARNER R. OVER

Penn Salt Names Over Treasurer

PHILADELPHIA, Pa., November 1, 1945—Warner R. Over has been named treasurer of the Pennsylvania Salt Manufacturing Company here following the retirement of L. A. Smith who served as vice-president and treasurer. Mr. Over, who joined Pennsylvania Salt as a clerk in 1904, was appointed secretary of the company in 1940, combining this with the title of assistant treasurer. He will now act as secretary-treasurer.

Manhattan Rubber Wins DMAA Award

The Direct Mail Advertising Association, at its Annual Meeting in New York City, has just announced that The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., has been selected a Direct Mail leader for 1945 for its advertising and sales promotion campaign. This is the Association's highest award.

Manhattan has been particularly successful in its advertising campaigns as it has won nine prizes in eight years from Industrial Advertising, Advertising Agency, and Direct Mail Associations. The Manhattan Rubber Manufacturing Division received two other first awards in 1945 from the National Advertising Agency Network, one for the best integrated advertising and merchandising campaign, and the other for the best employee relations program.

U. S. To Close Paper Warehouses

The Public Printer has initiated action to discontinue the entire warehouse organization which he set up as a war measure to handle contracts made with commercial printers. Three of the warehouses—Dallas, Atlanta, and San Francisco—terminated their operations on October 31. The Philadelphia Office was shut down on September 29.

The warehouse space in New York and Chicago is being released as of December 31. The St. Louis Office will be given up on the same date.

Printing programs which must be maintained in the warehouse areas will be directed from Washington in the same manner that contracts were handled prior to the creation of the warehouses.

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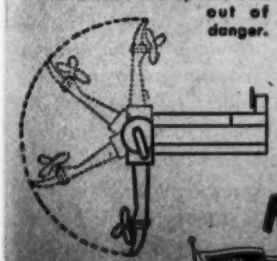
Proved by constant action in all invasions these compact, dependable Units *do* the job much better—give operators the *tops* in all phases of operation. *Up your* production schedule,—write today for the new catalog and applications of the "Harbormaster", the Unit that gives more thrust per horsepower than any other conventional propelling and steering apparatus!

The entire tail assembly may be elevated. Damage from submerged obstacles is prevented by a shear pin which shears off, automatically allowing the outboard drive to move back and upward . . . out of danger.



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COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

EMPIRE STATE SECTION. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

CHICAGO PROFESSIONAL PAPER GROUP. Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

PULPWOOD SUPPLY IS TIGHT

Raw materials for papermaking, so far as pulpwood and paper stock are concerned, continue in tight supply. From current data and estimates the outlook is reasonably optimistic. About the best prediction that can be made now is that the wood pulp supply situation will continue relatively tight throughout the first quarter of 1946. The demand for all grades of paper and paperboard is widely reported as strong. Wartime orders are being quite rapidly replaced with civilian orders. With inventories of finished products very low at mills and among merchants some months must pass before the pent-up demand can be satisfied and backlogs of orders can be reduced to a more normal level.

The pulpwood supply situation is admittedly tight. The charted trend of receipts by the Department of Commerce, indicates a continued rise, as had been the case in all years from 1941 to 1945 inclusive. Total inventories in the first half of 1945 were also upward, as was the case in all other years mentioned, except in 1941 when inventories leveled out in August to continue downward for the remainder of that year. Total receipts of pulpwood at U. S. mills in August, 1945, aggregated 1,685,000 cords, against 1.755,000 cords in 1944; for the eight months of 1945, total receipts were 11,651,000 cords, compared with 11,749,000 cords in 1944, and with 10,000,000 cords in 1943; the decrease in 1945 below 1944 was 0.8%. Total consumption in the eight months of 1945, was 11,392,000 cords, compared with 11,084,-000 cords in 1944, and with 10,496,000 cords in 1943; a gain in 1945 of 2.8%. Total inventories aggregated in the eight-month period, 2,887,000 cords in 1945, 3,366,000 cords in 1944, and 2,739,000 cords in 1943; the decline in inventories in 1945 below 1944 was 14.2%. In the first eight months of 1945, the greatest increase in pulpwood receipts was reported in the Northeast region, at 17.5%; the next greatest increase was in the South, at 1.6%. Consumption was highest in the Lakes States, at 5.8%, and next highest in the South, at 3.4%. A rise in inventories was alone reported in the Northeast region, at 9.2%, declines of 39.1% occurred in the South, 20.1% in the Appalachian area, 17.9% in the Pacific Northwest, and 17.0% in the Lakes States.

For the eight months of 1945, the Department reports that the total cumulated pulpwood receipts, plus imports, were 0.8% below 1944, with total domestic receipts 1.5% below, and imports 5.6% above. The Northeast region continued to improve in July, in the Appalachian region receipts were about the same as last year. In the South August receipts increased 51,000 cords, and in the Lake States, 18,000 cords; while in the Pacific Northwest receipts in August were about the same as last year, the essential need in the latter area being more pulpwood and experienced woods labor.

In commenting on the latest data the Department of Commerce states that pulpwood requirements continue to be the major current and long range problem facing the paper and pulp industry. Unless woods operations and deliveries to mills can be maintained, mills cannot keep pulp and paper production at current high levels in an effort to meet strong market demands. The pulpwood problem is largely one of woods labor, especially encouragement to returning veterans and war workers to resume their former occupations in logging operations. Reconversion demands for paper and paperboard are still mounting and this calls for increased pulpwood production, particularly in the Northeast, Lake States, and in the South. The seriousness of the situation is recognized by both industry and Government agencies. The War Activities Committee of the Pulpwood Consuming Industries is undertaking an advertising campaign in close liaison with the War Manpower Commission and the local offices of the United States Employment Service, for the purpose of directing unemployed war production workers into the pulpwood industry. Such a campaign is timely in view of the lack of any noticeable trend of workers to the woods.

The American Pulpwood Association reports that its mechanization program on pulpwood logging has accentuated the need for training men for woods operations, especially in view of the recent downward trend in labor efficiency and an upward trend in labor costs. As a consequence, the association has announced a Job Instructor Training (JIT) program to train men in pulpwood production. The association reports it is ready to assist any group in organizing training conferences. Underlying the need for woods workers in the immediate future, is the imminent loss of prisoners of war labor. The Army expects heavy prisoner of war movements to begin late in December and that all prisoners will be sent from the country within two months thereafter. The prisoners of war put in 445,303 man-days of work in logging operations in the production of saw logs and pulpwood, during August, compared with 440,-

840 man-days in July. Prisoner labor for logging declined somewhat in September due to transfer of some prisoners to food harvesting operations, but the decline was not as great as had been previously expected. It was stated by WPB officials that, although all controls over pulpwood supply and allocation were ended when Order M-251 was revoked, the Forest Products Bureau will continue to aid the pulpwood industry with production problems as long as possible. The responsibility for stimulating pulpwood production now rests entirely with industry.

In conclusion the report summarized the pulpwood situation as follows: Pulpwood procurement still remains tight. The solution of the pulpwood problem is now, as it has been since 1940, dependent upon the recruitment of enough new workers to meet the greater needs. The South faces the prospect of losing all prisoners of war labor. This will be a hard blow for the regional labor supply, for pulpwood cutting is usually low at this time of year when farm crops are being harvested. Pulpwood inventories are approximately at wartime normals, with the exception of the southern region which had 39% lower inventories than a year ago.

PAPER SALES UP

The sales of paper wholesalers in August showed a smaller than normal increase, the Department of Commerce reports, rising 4% from July and taking the sales index to 150.6. Inventories, on the other hand, showed an increase of 2% from the preceding month, which raised this index to 85.6.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Sept. 22	94.3	Sept. 23	91.9
Sept. 29	98.1	Sept. 30	93.5
Oct. 6	94.1	Oct. 7	93.4
Oct. 13	96.2	Oct. 14	92.9
Oct. 20	96.5	Oct. 21	90.7
Oct. 27	*95.8*	Oct. 28	91.3

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	*90.2*				

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to date	70.7	81.3	86.1	96.2	92.0	88.5	88.3	*88.9*
Year average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

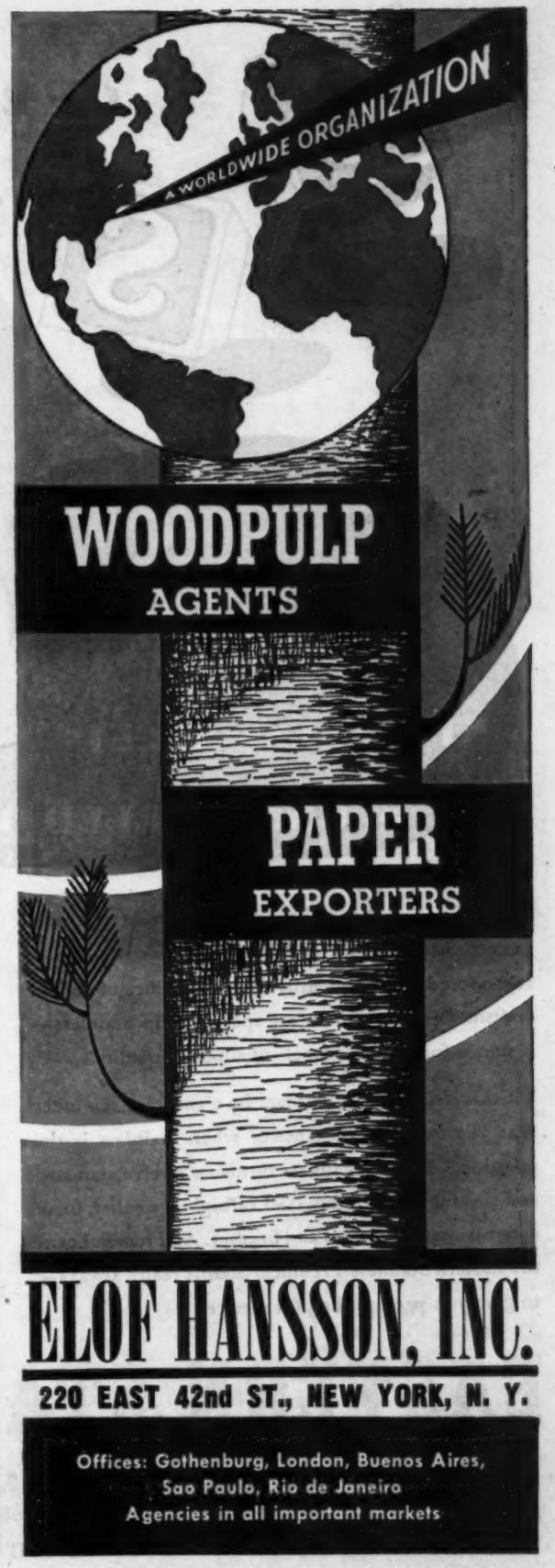
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

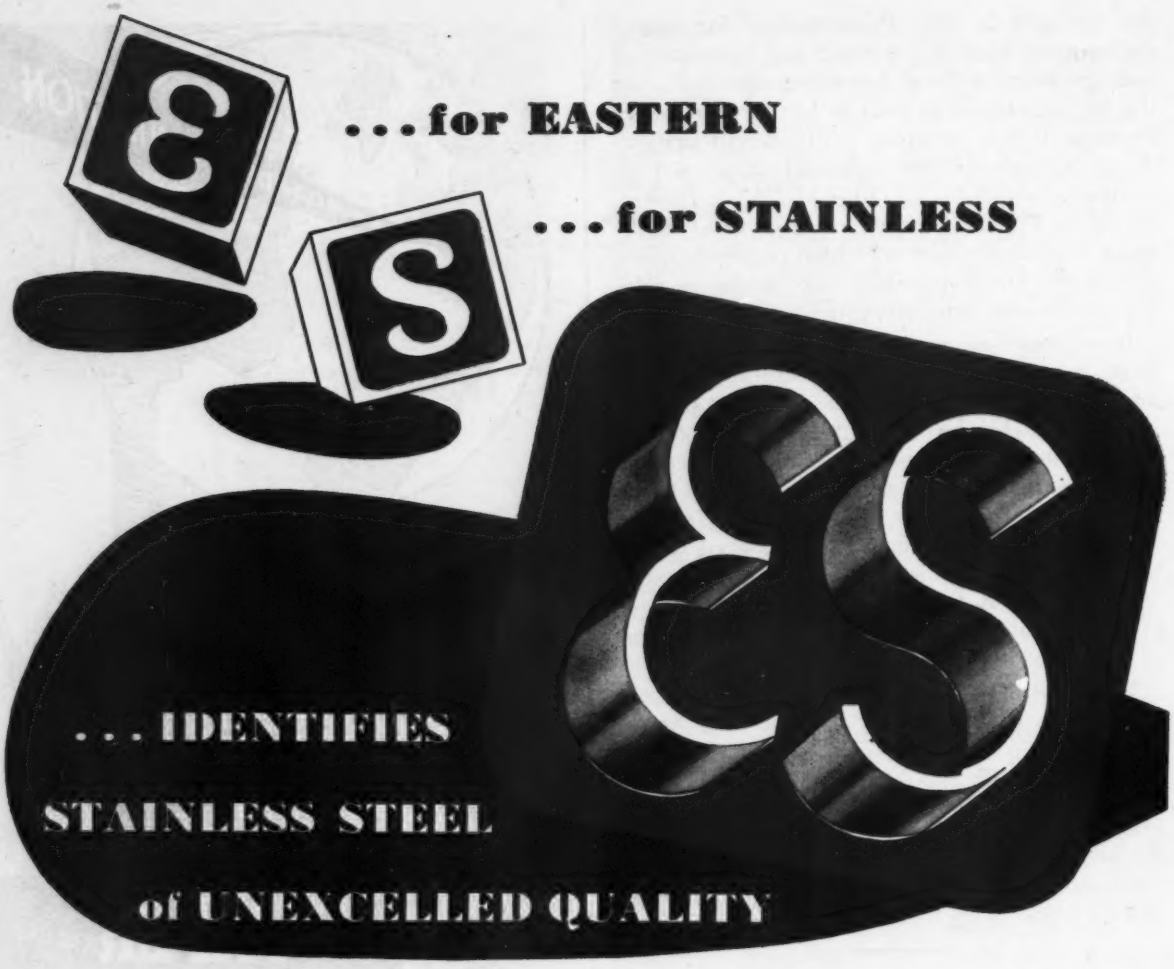
PAPERBOARD OPERATING RATIOS †

Current Weeks—1945		Corresponding Weeks—1944	
Sept. 22	93	Sept. 23	96
Sept. 29	96	Sept. 30	95
Oct. 6	93	Oct. 7	96
Oct. 13	97	Oct. 14	96
Oct 20	96	Oct. 21	94
Oct. 27	*98*	Oct. 28	95

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	86	90	*91*				

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.





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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Relative Toxicity of Disinfectants Recommended for Use in the Paper Industry

III. Inhibiting Concentrations of Additional Disinfectants for *Aerobacter aerogenes, Bacillus mycoides,* and *Aspergillus niger.*

By John W. Appling[1] and John F. McCoy[2]

Abstract

New toxicity data are reported for nine disinfectants. The same test organisms and techniques were employed as before. The disinfectants tested include three detergents, Emulsept E607 Special, Nacconol FSNO, and Roccal; one chlorinated phenolic compound, Dowicide G; two organic mercurials, pyridylmercuric acetate and pyridylmercuric chloride; and three materials whose active ingredients are unknown to the authors, Caso-Cide, Penetox, and Ramplex C-106. Considered as a group, the nine materials were most effective against Bacillus mycoides *and least effective against* Aspergillus niger. *The pyridylmercuric compounds were as toxic toward* Aerobacter aerogenes *and* Bacillus mycoides *as the phenylmercuric ones previously reported, but appreciably less toxic toward the fungus* Aspergillus niger. *Dowicide G was quite comparable in toxicity with Santobrite and Nalco 21, as might be expected since all three contain as the main ingredient sodium pentachlorophenate. The nine materials are compared in three ways: (a) on the basis of toxicity toward each test organism; (b) on the basis of the cost per pound of disinfectant; and (c) on the basis of cost and toxicity considered jointly. Again it is emphasized that cost-toxicity data can be applied most successfully to specific microbiological problems in the mill when the types of microorganisms involved are known. The evaluation program is being continued to test all new disinfectants as they may appear from time to time and are recommended by their manufacturers for use in the paper industry.*

Since the publication of the two previous articles (*1, 2*) in this series, the authors have found it advisable to define or explain various terms which are used to describe the effect of poisonous materials on microorganisms. The authors use the term *toxicity* to describe the ability of an agent to interfere adversely with the vital processes of an organism by physicochemical means. The effect on the organism may be either to inhibit its growth or to kill it. In both instances, various terms are used to designate the type of microorganism affected, e.g., a *fungistatic* (or *mycostatic*) effect is the inhibition of fungi and a *fungicidal* effect is the killing of fungi. *Bacteriostatic* and *bactericidal* are the corresponding terms for bacteria. The term *disinfectant* is used by the authors to designate an agent which inactivates or kills harmful organisms within the immediate environment. Contrary to the medical use of this term, it is used to include the effect on spores as well as vegetative cells of microorganisms. A better but less familiar term for the above is *toxicant*, which is widely used by the mycologists. Another excellent, but little used, term is *antimicrobic* which would be much more descriptive than the term toxic used by the authors. *Antimicrobic*, as the name implies, means a toxic effect upon microorganisms. This term should not be confused with *antibiotic*, which is a specific toxic effect produced by certain metabolic products of microorganisms. Penicillin is a metabolic product of the fungus (or mold) *Penicillium notatum* and its antibiotic effect is well known.

By means of the Petri plate method of evaluation as described in the previous articles of this series, the inhibiting concentrations of an additional nine chemical disinfectants have been determined for the three test organisms previously used. The testing techniques for the use of *Aerobacter aerogenes* (*1*), and *Bacillus mycoides* and *Aspergillus niger (2)* were employed with one necessary modification for obtaining the data reported in this paper. This modification was applied to the four disinfectants that were supplied as liquids, namely, Caso-Cide (Permacide AM-10), Emulsept E 607 Special, Ramplex C-106, and Roccal. Whereas the solid disinfectants were diluted on a weight basis, the liquid disinfectants were diluted on a volume basis and all calculations were made as though a weight basis had been used.

The data obtained with the three test organisms have been summarized in Tables I, II, and III. The trade names of the materials rather than their chemical compositions have been used and the data reported have been based upon the materials as fur-

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[2] Technical Assistant, The Institute of Paper Chemistry, Appleton, Wis.

TABLE I.—INHIBITING CONCENTRATIONS OF VARIOUS DISINFECTANTS FOR *AEROBACTER AEROGENES* AS DETERMINED BY THE PETRI PLATE METHOD

(Difco Nutrient Agar, incubated at 37° C. for 24 hours.)

Trade Name of Disinfectants	Range of Concentration Tested, %	Increment Used in Range, %	Inhibiting Concentration	
			Streak 1	Streak 2
1. Caso-Cide (Permacide Am-10)	0.0020 -0.0200	0.0020	0.0040	0.0040
	0.0020 -0.0060	0.0020	0.0040	0.0040
2. Dowicide G	0.0100 -0.0260	0.0020	0.0180	0.0200
	0.0100 -0.0260	0.0020	0.0180	0.0180
3. Emulsept E 607 Special	0.0200 -0.2000	0.0200	0.0400	0.0400
	0.0200 -0.1000	0.0200	0.0400	0.0400
4. Nacconol FSNO	0.0200 -0.2000	0.0200	>0.2000	>0.2000
	0.1600 -0.2000	0.0200	>0.2000	>0.2000
5. Penetox (new formulation)	0.0050 -0.0300	0.0050	0.0150	0.0150
	0.0050 -0.0250	0.0050	0.0150	0.0150
6. Pyridylmercuric acetate	0.00005-0.0020	0.0002	0.0001	0.0001
	0.00005-0.0002	0.00005	0.0001	0.0001
7. Pyridylmercuric chloride	0.00005-0.0020	0.0002	0.0001	0.0001
	0.00005-0.0002	0.00005	<0.0001	<0.0001
8. Ramplex C-106	0.0016 -0.0026	0.0002	0.0022	0.0022
	0.0016 -0.0024	0.0002	0.0024	0.0024
9. Roccal	0.0140 -0.0240	0.0020	0.0220	0.0200
	0.0140 -0.0240	0.0020	0.0200	0.0200

TABLE II.—INHIBITING CONCENTRATIONS OF VARIOUS DISINFECTANTS FOR *BACILLUS MYCOIDES* AS DETERMINED BY THE PETRI PLATE METHOD

(Difco Nutrient Agar, incubated at 37° C. for 48 hours.)

Trade Name of Disinfectants	Range of Concentration Tested, %	Increment Used in Range, %	Inhibiting Concentration	
			Streak 1	Streak 2
1. Caso-Cide (Permacide AM-10)	0.0002 -0.0020	0.0002	0.0016	0.0016
	0.0010 -0.0020	0.0002	0.0014	0.0014
2. Dowicide G	0.0002 -0.0020	0.0002	0.0006	0.0004
	0.0002 -0.0008	0.0002	0.0004	0.0004
3. Emulsept E 607 Special	0.0020 -0.0200	0.0020	0.0120	0.0120
	0.0020 -0.0200	0.0020	0.0160	0.0160
4. Nacconol FSNO	0.0002 -0.0020	0.0002	0.0020	0.0020
	0.0014 -0.0024	0.0002	0.0016	0.0016
5. Penetox (new formulation)	0.0010 -0.0030	0.0002	0.0012	0.0012
	0.0008 -0.0016	0.0002	0.0016	0.0016
6. Pyridylmercuric acetate	0.000005-0.0002	0.00002	0.00001	0.00001
	0.000005-0.0002	0.00001	0.00002	0.00002
7. Pyridylmercuric chloride	0.000005-0.0002	0.00002	0.00001	0.00001
	0.000005-0.0002	0.00002	0.00002	0.00002
8. Ramplex C-106	0.0002 -0.0020	0.0002	0.0004	0.0004
	0.0002 -0.0006	0.0002	0.0004	0.0004
9. Roccal	0.0002 -0.0020	0.0002	0.0008	0.0008
	0.0002 -0.0012	0.0002	0.0006	0.0006

TABLE III.—INHIBITING CONCENTRATIONS OF VARIOUS DISINFECTANTS FOR *ASPERGILLUS NIGER* AS DETERMINED BY THE PETRI PLATE METHOD

(Malt Agar, incubated at 30° C. for 7 days.)

Trade Name of Disinfectants	Range of Concentration Tested, %	Increment Used in Range, %	Inhibiting Concentration	
			Streak 1	Streak 2
1. Caso-Cide (Permacide AM-10)	0.0020 -0.0200	0.0020	0.0200	0.0180
	0.0160 -0.0300	0.0020	<0.0160	0.0180
2. Dowicide G	0.0002 -0.0020	0.0002	0.0020	0.0020
	0.0010 -0.0022	0.0002	0.0016	0.0016
3. Emulsept E 607 Special	0.0200 -0.2000	0.0200	0.0800	0.0800
	0.0400 -0.1600	0.0200	0.1200	0.1200
4. Nacconol FSNO	0.0200 -0.2000	0.0200	0.1200	0.1200
	0.0800 -0.1600	0.0200	0.1000	0.1000
5. Penetox (new formulation)	0.0020 -0.0200	0.0020	0.0160	0.0160
	0.0100 -0.0200	0.0020	0.0200	0.0200
6. Pyridylmercuric acetate	0.00005-0.0020	0.0002	0.0004	0.0004
	0.0002 -0.0006	0.0002	0.0004	0.0006
7. Pyridylmercuric chloride	0.00005-0.0020	0.0002	0.0004	0.0004
	0.0002 -0.0006	0.0002	0.0006	0.0006
8. Ramplex C-106	0.0020 -0.0200	0.0020	0.0040	0.0040
	0.0020 -0.0060	0.0020	0.0040	0.0020
9. Roccal	0.0200 -0.2000	0.0200	0.0800	0.0800
	0.0400 -0.1200	0.0200	0.0600	0.0600

nished by the manufacturer and not upon the amounts of active ingredient present in the materials, e.g., the manufacturers of Emulsept give the analysis of this material in terms of active ingredient, *N*-(acylcolaminoformylmethyl) pyridinium chloride. However, the inhibiting concentrations have been reported on the basis of the product Emulsept and not on the basis *N*-(acylcolaminoformylmethyl) pyridinium chloride.

A comparison of the ability of the disinfectants tested to inhibit the growth of each of the three test organisms has been made in Table IV by calculating the average values for the inhibiting concentrations given in Tables I, II, and III. For convenience and the establishment of a basis for comparison of cost-toxicity data, these have been computed in percentages and in parts per million. For purposes of comparison, Table IV includes the data previously obtained with phenylmercuric acetate (*1, 2*).

The order of resistance of the test organisms differed from that reported in a previous paper (*2*). The most resistant of the three organisms was the fungus *Aspergillus niger*, whereas the least resistant was the spore-forming bacterium *Bacillus mycoides*. The nonspore-forming bacterium *Aerobacter aerogenes*, which was the most resistant organism against the types of compounds tested previously, was not quite as resistant to the types of compounds reported in the present work as was *Aspergillus niger*. The detergents represented by Emulsept E 607 Special, Roccal, and Nacconol FSNO, of which the first and second are known to be cationic, are not as toxic to *Aspergillus niger* as they are to *Aerobacter aerogenes*, but with the organic mercurials and the chlorinated phenols their positions are reversed, with *Aerobacter aerogenes* the more resistant. However, *Bacillus mycoides* was the easiest of the three organisms to control by all groups of disinfectants thus far reported in this series of papers.

Two new types of organic mercurial compounds are represented by the pyridylmercuric group of disinfectants. These were as effective against *Aerobacter aerogenes* and *Bacillus mycoides* as the phenylmercuric group; however, they were four to five times less effective against the fungus *Aspergillus niger*.

Dowicide G was effective for inhibiting each of the three test organisms at approximately the same concentrations as were the other two materials containing chiefly sodium pentachlorophenate—namely, Santobrite and Nalco 21 (*1, 2*).

The compositions of Caso-Cide, Penetox, and Ramplex C-106 are unknown to the authors at the present time. The inhibiting concentrations reported for them show that they were quite toxic toward the test organisms and especially to the spore-former *Bacillus mycoides*.

The average price per pound of each disinfectant has been furnished by its respective manufacturer and is given in Table V. These have been combined with the average inhibiting concentration in parts per million for each test organism as given in Table IV and the resulting cost-toxicity data may be found in Table VI which also includes a commercial grade of phenylmercuric acetate for the purpose of comparison. Since the prices quoted were based on the weight in pounds, it should be of interest to calculate the cost in terms of the inhibiting concentration or toxicity, e.g., the inhibiting concentration of pyridylmercuric acetate for *Aerobacter aerogenes* is 1.0 pound per million pounds to be treated. The cost

of treating one million pounds would be 1.0 × $6.50 or $6.50. However, if the inhibiting concentration of pyridylmercuric acetate for *Bacillus mycoides* were used, the cost per million pounds would be 0.15 × $6.50 or $0.98. The cost-toxicity data for each of the disinfectants reported at this time against each of the three test organisms have been calculated and are given in Table VI. It is obvious from the toxicity data that the three test organisms vary considerably in their resistance to the various disinfectants. Consequently, the cost of treating on the basis of one million pounds of water, pulp suspension, or other material will depend not only upon the price per pound of disinfectant but also upon the types of organisms to be inhibited.

Application of Cost-Toxicity Data to Mill Problems

The data presented in this series of papers show the futility of selecting a disinfectant solely upon a cost basis. However, it would be uneconomical to disregard cost and to select a disinfectant solely upon a toxicity basis. The most effective and economical use of disinfectants can be made by the use of cost-toxicity data.

The application of cost-toxicity data presupposes a knowledge of the types of organisms to be inhibited. Moldproofing paper and pulp is a good illustration for the application of such data. One of the three test organisms, *Aspergillus niger*, is a mold which is commonly found on moldy paper and pulp. Table III gives the inhibiting concentrations of each disinfectant for this mold. When these toxicity data are combined with the cost data in Table V, the cost-toxicity data for *Aspergillus niger* result. Upon examining these values in the last column of Table VI, it is relatively easy to make effective choices for specific cases of moldproofing.

Slime control is another example to which cost-toxicity data may be applied. Slimes differ considerably in composition and appearance. A knowledge of the principal types of organisms in a particular slime becomes necessary in the light of the cost-toxicity data. The dosage and the cost will be dependent upon the types to be inhibited. Since the cost-toxicity data (Table VI) show that *Bacillus mycoides* (a spore-former) can be inhibited most economically, it follows that bacterial slimes which contain chiefly spore-formers would require smaller dosages than bacterial slimes which contain chiefly nonspore-formers such as *Aerobacter aerogenes*. The problem of slime control is unfortunately more complicated than the simple cases just described. One, two, or all three types represented by the three test organisms may be present in paper-mill slime. The important point to note here is that the types of organisms present in the slime as it leaves the mill must be determined if the cost-toxicity data are to be applied most effectively. If facilities are available, the bacteriological examination of slime should be made at the mill. However, in some cases, it is necessary to send the slime sample to a distant laboratory. If this is done, the sample should be properly refrigerated and transported as rapidly as possible in order to minimize the changes in the original microflora. The bacteriological examination of slime is not an easy one, even for an experienced microbiologist. An alternative has been suggested in the preceding paper (*2*)—namely, the development of a disinfectant which will be sufficiently toxic to every type of microorganism that it will effectively control every type of slime. Although

TABLE IV.—COMPARISON OF INHIBITING CONCENTRATIONS FOR THREE TEST ORGANISMS

Trade Name of Disinfectant	Inhibiting Concentration % by Weight (Average)[1] for			Inhibiting Concentration p.p.m. (Average)[1] for		
	Aerobacter aerogenes	*Bacillus mycoides*	*Aspergillus niger*	*Aerobacter aerogenes*	*Bacillus mycoides*	*Aspergillus niger*
1. Caso-Cide [3] (Permacide AM-10)	0.0040	0.0015	0.0180	40	15	180
2. Dowicide G	0.0180	0.0004	0.0018	180	4	18
3. Emulsept E 607 Special [3]	0.0400	0.0140	0.1000	400	140	1000
4. Nacconol FSNO	>0.2000	0.0018	0.1100	>2000	18	1100
5. Penetox (new formulation)	0.0150	0.0014	0.0180	150	14	180
6. Pyridylmercuric acetate	0.0001	0.000015	0.0005	1	0.15	5
7. Pyridylmercuric chloride	0.0001	0.000015	0.0004	1	0.15	4
8. Ramplex C-106 [3]	0.0023	0.0004	0.0040	23	4	40
9. Roccal [3]	0.0200	0.0007	0.0700	200	7	700
10. Phenylmercuric acetate [3]	0.0001	0.00001	0.0001	1	0.1	1

[1] Average made on basis of increments used in each case.
[2] From the previous papers (*1*, *2*), the corresponding data for the most toxic disinfectant, a technical grade of phenylmercuric acetate, are included for comparison.
[3] Inhibiting concentration expressed as % by volume since these are liquids.

TABLE V.—COST DATA FOR VARIOUS DISINFECTANTS

Trade Name of Disinfectant	Name and Address of Manufacturer or Distributor	Average Price Quoted *
1. Caso-Cide (Permacide AM-10)	Castle Overton, Inc. 630 Fifth Avenue Rockefeller Center New York, New York	$0.60 per pound in lots of 5,000 pounds
2. Dowicide G	Dow Chemical Company Midland, Michigan	$0.165 per pound in lots of 30,000 pounds
3. Emulsept E 607 Special	Merchants Chemical Company Tribune Tower Chicago 11, Illinois	$3.00 per gallon in 55-gallon drums
4. Nacconol FSNO	National Aniline Division Allied Chemical & Dye Corp. 40 Rector Street New York, New York	$0.65 per pound
5. Penetox (new formulation)	Magnus Chemical Company Garwood, New York	$0.20 per pound in lots of 500 pounds
6. Pyridylmercuric acetate	Mallinckrodt Chemical Works Second & Mallinckrodt Streets St. Louis, Missouri	$6.50 per pound in lots of 500 pounds
7. Pyridylmercuric chloride	Mallinckrodt Chemical Works Second & Mallinckrodt Streets St. Louis, Missouri	$6.50 per pound in lots of 500 pounds
8. Ramplex C-106	Merchants Chemical Company Tribune Tower Chicago 11, Illinois	$1.20 per pound in 55-gallon drums
9. Roccal	Winthrop Chemical Co., Inc. 445 Lakeshore Drive Chicago, Illinois	$4.71 per gallon

* It must be understood that the cost data are only representative and in nearly every case the cost will depend upon the consumption of the disinfectant. In all cases the paper or pulp mill should consult directly with the manufacturer.

TABLE VI.—COST-TOXICITY DATA

Trade Name of Disinfectant	Average Price Per Pound	(Inhibiting Concentration in p.p.m.) × (Average Price Per Pound)		
		Aerobacter aerogenes	*Bacillus mycoides*	*Aspergillus niger*
1. Caso-Cide (Permacide AM-10)	$0.60	$24.00	$9.00	$108.00
2. Dowicide G	0.165	29.70	0.66	2.97
3. Emulsept E 607 Special	0.36 [3]	144.00	50.40	360.00
4. Nacconol FSNO [1]	0.65	>1300.00	11.70	715.00
5. Penetox (new formulation)	0.20	30.00	2.80	36.00
6. Pyridylmercuric acetate	6.50	6.50	0.98	32.50
7. Pyridylmercuric chloride	6.50	6.50	0.98	26.00
8. Ramplex C-106	1.20	27.60	4.80	48.00
9. Roccal	0.57 [3]	114.00	3.99	399.00
10. Phenylmercuric acetate [2]	11.20	11.20	1.12	11.20

[1] On the basis of information supplied by the manufacturers a commercial grade of Nacconol FSNO, designated as Nacconol NR which is about 2¼ times less toxic than Nacconol FSNO, sells for about five times less, or 13 cents per pound. This would cut its cost-toxicity data to half that shown.

[2] From the previous papers (*1, 2*), the corresponding data for the most toxic disinfectant, a technical grade of phenylmercuric acetate, are included for comparison.

[3] Calculated from specific gravity determination.

attempts have been and continue to be made in this direction, no such material is known to the authors.

Extent of Program

The committee is anxious to expand the testing program to include all commercially available disinfectants which are being recommended for use in the paper industry. It is willing to determine the inhibiting concentration of any representative sample which a mill may wish to have examined. There are only a few on hand to be tested at present; therefore, more are desired. It was stated in the first paper that the committee would be glad to include such promising new materials as its testing program permitted. If any manufacturer wishes to submit any new materials prior to their release for mill use, he should communicate with the committee.

Literature Cited

1. Appling, J. W., and McCoy, J. F., *Paper Trade J.* 119, No. 11: 116-118 (Sept. 14, 1944).
2. Appling, J. W., and McCoy, J. F., *Paper Trade J.* 121, No. 3: 37-40 (July 19, 1945).

Delaware Valley Discusses Role of the Paper Technician

Walter G. Hendrich of the Hammermill Paper Company was the speaker at the meeting of the Delaware Valley Section which was held at the Engineer's Club in Philadelphia, November 2, 1945. The title of his talk was "How Can the Paper Technician Further Progress in the Industry."

It was pointed out that although the value of the chemist has been recognized by mill management, there is much that can be done to organize his work so that it may be even more beneficial. In many cases too much stress has been placed on tests that are relatively unimportant and has resulted in a wastage of laboratory time and effort. It was recommended that all the departments in the mill be subjected to a critical analysis to determine the relative importance of the control currently conducted and also the points at which more coverage is required. Proper attention to instrumentation may save many hours of the technicians valuable time.

Mr. Hendrich emphasized that the laboratory has a definite function in the evaluation of the products of the mill. Each problem involves consideration of six major items: Product, raw material, equipment, method, personnel, and cost. In this connection it is well to objectively review the market so that efforts can be directed to those products which offer the most favorable opportunity for the company.

The laboratory must not lose sight of the fact its effectiveness is, to a large extent, determined by its relations with the rest of the mill personnel, both management and operating, and every effort should be made to further congenial relationship as well as a better understanding of the activities of the technician. Those attending the meeting were:

Edward J. Albert, E. R. Baublitz, Dorothy A. Beiswinger, Richard T. Bingham, A. L. M. Bixler, Robert J. Bothwell, Alan R. Boyd, F. W. Brainerd, Samuel M. Bratton, C. L. Brickman, Philip G. Bruno, Charles W. Carr, Jr., John Carson, H. D. Childers, E. Earll Church, C. M. Connor, W. P. Dohn, Gerard J. Eberz, Kephard Emenheiser, J. M. Farnum, H. J. Farra, F. G. Felske, Jeanne H. Fisher, Mary R. Frame, J. F. Good, Ralph E. Green, L. V. Hans, J. C. Harper, Jr., Walter Hendrich, H. F. Hoffmann, Eugene A. Holland, Harry Hulmes, Valdemar A. Jacobsen, John W. MacAllister, Geo. B. Martin, A. L. Mayer, Louise E. McGrath, R. P. McGurley, Alex. McInnes, H. C. Merritt, Edward C. Molin, Walter Morehouse, Harvey E. Mumford, M. D. Reuben, J. A. Paciello, W. R. Scherer, Edward A. Shallcross, Wm. M. Shoemaker, L. Jay Smith, W. A. Steele, Howard H. Street, Geo. M. Suydam, Joseph J. Swift, G. Raymond Tomlinson, T. W. Toovey, D. R. Traill, G. C. Walton, A. E. Waugh, John P. Weidner, R. Wiggins, W. Wilkinson, Ray Wilcox, William R. Willets.

The Chemical Process Industries

The McGraw-Hill Book Company has just published The Chemical Process Industries by R. Norris Shreve, Professor of Chemical Engineering at Purdue University (957 pp., 6 x 9). The author follows modern mill and factory practice in breaking down the actual industrial procedures into unit operations and unit processes. The book presents a wealth of flow sheets and covers recent advances in the various fields. The book is included in the McGraw-Hill Chemical Engineering Series.

Among the subjects covered are materials of construction, process instrumentation, chemical control, containers, patents, research, waste disposal, water conditioning, waste water treatment, fuels, power, coal, industrial carbon, alkalies, paint and varnish, glue, oils, fats and waxes, surface active agents, starch, fermentation industries, synthetic fibers, plastics, dyes, and pulp and paper. About 22 pages are devoted to the latter and is a good brief summary of the processes. Technical men in the industry, however, will be interested primarily in the many other subjects covered.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry at $7.50 per copy.

Atomic Power

Although atom splitting may have nothing to do with pulp and paper making the subject of atomic energy has attracted universal interest. An excellent book on the subject is Uranium and Atomic Power by Jack De Ment of the Mineralogist Laboratories and H. C. Dake, editor of the Mineralogist Magazine, published by the Chemical Publishing Company (343 pp. 6 x 9). This is a clearly written practical book for the layman and chemist and gives the information essential to an understanding of atomic power.

Locked within each atom is a reservoir of tremendous energy. The present methods of releasing this energy from uranium are complex and very expensive, but intensive research will, no doubt, produce atomic energy more plentifully and less expensively. Two chapters are devoted to the occurrence and properties of uranium minerals and two others to their qualitative and quantitative analysis. The remaining chapters discuss the chemistry and physics of uranium and specific methods of uranometry.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $4.00 per copy.

Hydrogen Peroxide in the Pulp and Paper Industry

By H. O. Kauffmann[1]

Abstract

The properties and simplicity of application make hydrogen peroxide a chemical well suited to the commercial bleaching of pulp. The properties, methods of application, and cost of treatment with hydrogen peroxide are given.

Because of higher cost, peroxides are not generally considered as replacements for the chlorine bleaching agents. However, there are a number of applications where they are economically feasible since they bleach without chemical damage to the cellulose and can be used to process groundwood and semichemical pulps.

Interest in the bleaching of pulps with peroxide has been stimulated in recent years because of the better quality of wood products obtained and a desire to utilize the raw materials as efficiently and economically as possible. The use of peroxides for bleaching groundwood pulp has been described in a number of publications and considerable information can be obtained from the papers by J. Reichert *(1, 2)*.

Hydrogen peroxide has become one of the most important bleaching agents in the textile industry and it is anticipated that it will play an important part in the pulp and paper industry. At the present time, hydrogen peroxide, like all other peroxide chemicals, is under allocation by the War Production Board. However, a great deal of research on its application has been carried out and is being continued. The object of this article is to acquaint the pulp and paper industry with the properties, behavior, and novel applications of hydrogen peroxide in the industry. Subsequent publications will cover this subject thoroughly and will include data developed since the submission of this report.

Properties of Hydrogen Peroxide

Pure hydrogen peroxide is a liquid at room temperature which freezes at —2° C. It has a specific gravity of about 1.46 and is miscible with water in any proportion. For industrial use, hydrogen peroxide is shipped in aqueous solutions containing from 27 to 50% hydrogen peroxide. Before the war, 27.5% solutions were predominantly used for bleaching purposes. However, solutions of higher concentrations can be shipped in suitable containers, including tank cars.

There has been a great deal of confusion regarding the composition of such solutions. This was mainly because of the fact that hydrogen peroxide solutions were designated by "volume" of oxygen developed upon complete decomposition. For instance a 27.5% hydrogen peroxide solution was called 100 volume, since 1 volume will develop 100 volumes of oxygen gas when completely decomposed. The specific gravity of aqueous solutions of hydrogen peroxide increases with increasing hydrogen peroxide content and the term volume does not increase proportionally with the increase of concentration. A much better way of designating hydrogen peroxide solutions is based on its chemical behavior and the expression "active oxygen" has been used more widely in recent years. The following table gives the various designations and their relationship.

Hydrogen Peroxide, %	Density $\frac{18}{4}$	Volume	Active Oxygen, %
10	1.034	34	4.7
20	1.072	70	9.4
27.5	1.102	100	13.0
30	1.111	110	14.1
35	1.133	132	16.5
50	1.203	208	23.5
100	1.465	475	47.0

Aqueous hydrogen peroxide solutions are manufactured by electrolytic oxidation of bisulphates or sulphuric acid solutions. The formed persulphates or persulphuric acid are then converted into hydrogen peroxide. Since for economical production active oxygen losses have to be avoided, great care is taken by the manufacturers to work with very pure solutions and avoid contamination of the products. Hydrogen peroxide, therefore, represents a very pure chemical and has a very high storage stability. This high stability is reflected in the application and contributes greatly to the economy in hydrogen peroxide bleaching.

Hydrogen peroxide solutions are shipped in glass carboys, aluminum drums, and aluminum tank cars. The contents of a tank car shipped to the consumer are pumped to stationary tanks which may hold from 2000 to 5000 gallons of the product. From these tanks, the hydrogen peroxide solution flows by gravity or is pumped directly to the chemical mixing equipment where it is brought in contact with the material to be bleached. The rate of flow may be controlled by any metering device, for instance, by chemical feeding pumps. Since hydrogen peroxide is readily miscible with water, dilution and distribution is effected immediately with little agitation and there is no danger of local violent reactions or premature decomposition of the product. The operator in a bleaching plant never comes in direct contact with the chemical.

Accidental contact of the skin with hydrogen peroxide solutions causes temporary bleaching of the epidermis, connected with a slight itching sensation; after a short time these conditions disappear entirely without leaving a mark or other injuries.

Commercial hydrogen peroxide solutions accidentally spilled or brought in contact with combustible materials represent no fire hazard. A 35% hydrogen peroxide solution spilled on a wooden floor bleaches the wood or decomposes harmlessly.

Commercial solutions are slightly acid and can be handled safely in glass, glass- or tile-lined, and stoneware equipment. Suitable metals are aluminum and stainless steel.

Simplicity of handling, safety in application, stability in storage and use make hydrogen peroxide a very suitable and practical bleaching agent.

By far the most important use of hydrogen peroxide is its application as a bleaching agent. Commercial hydrogen peroxide solutions simply diluted with water

[1] Member TAPPI; Director of Research, Buffalo Electro-Chemical Company, Inc., Station B, Buffalo 7, New York.

to a suitable concentration, bleach almost any organic material. For instance, a drop of such a solution brought in contact with a sheet of unbleached paper will produce a very marked bleaching effect. Buckskin soaked with a 2% hydrogen peroxide solution and allowed to dry, will become white. Of course, different materials are treated in various ways to obtain the best and most economical bleaching results.

By far the largest proportion of hydrogen peroxide has been used in the textile industry, especially for the bleaching of cotton. Its use is standard in this industry. This is mainly because of the fact that in the past fifteen years, the application of hydrogen peroxide has been greatly simplified and the cost of bleaching greatly reduced. Cotton goods, such as sheeting, were bleached ten years ago with hydrogen peroxide at a chemical cost of $6.00 per 1000 pounds and now 1000 pounds of the same material can be bleached to the same degree of brightness at a cost of less than $2.00. This drastic cost reduction is because of the fact that the cotton bleaching industry, in cooperation with the manufacturers, has learned how to make the best use of this bleaching chemical, hydrogen peroxide.

The percentages of hydrogen peroxide used for bleaching are small, but the results obtained are outstanding, especially as far as the quality of the bleached material is concerned. It is this property of peroxide bleaching that is of interest to the pulp and paper industry. It has been found, for instance, that the desirable qualities of groundwood pulp are maintained when the pulp is peroxide bleached. Brightness figures may be obtained by bleaching groundwood pulp with hydrogen peroxide that are in the region of fully bleached chemical pulps with a minimum loss in yield and without impairing the fiber strength. Partly bleached chemical pulp may be bleached with peroxide to a high degree of brightness without increasing its fluidity or permanganate number.

Hydrogen Peroxide Bleaching of Pulp and Paper

The present trend to bleach pulp and paper by the application of peroxides parallels the lines of its application in the textile industry. Such a trend is only natural since the experience gained in the textile industry is applicable to most wood pulps. Chemically refined wood fibers and cotton are similar in their behavior towards bleaching agents. Mechanical pulp, however, differs since a large proportion of noncellulosic constituents is present. Effective and economical bleaching of groundwood with peroxide is the subject of extensive research. It has already been demonstrated that groundwood pulp can be bleached with peroxide but additional work must be carried out to develop processes that are simple, economical, and require the least supervision in a mill.

Certain changes and additions in plant equipment are necessary. The new bleaching process should be of such a nature as to permit straight-line production and it must be sufficiently flexible to fill all the requirements of a particular plant.

In this respect, two important factors must be considered:

1. Continuity of operation and 2. economical aspects.

Continuity of Operation

The time of bleaching is important from a production standpoint and from a standpoint of equipment necessary to carry out peroxide bleaching. Bleaching processes requiring 6 to 8 hours will tie up a great deal of equipment as well as a great deal of space. If bleaching can be carried out in 1 to 2 hours, much less equipment is necessary and, of course, the initial investment is much lower. This is true in batch, as well as continuous operation.

The continuous operation has the advantage of obtaining a more uniform product and at a lower overall cost. It is the ultimate aim of most manufacturing plants. Bleaching with hydrogen peroxide lends itself very readily to this end. Bleaching times of 1 to 2 hours are possible and suitable equipment to do such a job can be made available. It will be of interest to point out that the cotton bleaching industry has made great strides in the past years to reduce the time of peroxide bleaching and has thus been able to operate in a continuous manner. To illustrate this, the cotton goods are saturated with a suitable hydrogen peroxide solution and allowed to pass continuously through a chute in which the bleaching takes place. Steam is applied to this chute to heat the bulk of the goods uniformly while it passes through the chute in about 1 hour. The goods then leave the chute, are washed in textile washers, and are then ready for the finishing and drying operation.

While such a bleaching procedure could conceivably be applied to pulp, the handling of the material must necessarily be carried out by different mechanical means. Instead of chutes, slow-moving conveyor belts may be used. Retention towers are well known in pulp processing and can be operated on a continuous basis. Cotton is best bleached at temperatures of 180°F. or above; most pulps can be bleached at lower temperatures. This is a great advantage since use of higher temperatures might decrease the yield. Furthermore, heating of pulp is expensive.

The pulp is thoroughly mixed with the bleaching chemicals, that is the hydrogen peroxide and an alkali, as for instance, silicate of soda, and continuously passed through retention vessels. From these, the pulp is withdrawn at the same rate as fresh pulp is added. It is of great importance to mix the bleaching chemicals thoroughly and uniformly with the incoming pulp. Since both hydrogen peroxide and sodium silicate are liquids, they may be added directly to the pulp from their respective storage containers by means of chemical feeders. Such feeders can be adjusted in a very simple manner to regulate the flow of chemicals and thereby keep it in step with the flow of pulp. If it is necessary to use additional alkali in the bleaching process, commercial 50% caustic soda solutions can be fed to the pulp in a similar way. Distribution of chemicals in the pulp may be accomplished by the use of low or high density mixers, or by spraying or padding laps with the chemicals.

The direct feeding of chemicals has many advantages. It eliminates the use of mixing tanks and weighing and handling of chemicals. Any changes of the bleaching formula that might be necessary because of conditions of the pulp may be made instantaneously—simply by turning a knob or valve of the chemical feeder to the desired predetermined position. Losses of chemicals are avoided since all chemicals are brought directly in contact with the pulp. This is especially important with regard to the peroxide since it is well known that alkaline peroxide stock solutions lose active oxygen during standing. Such losses are especially high with solutions of high alkalinity.

Retention equipment must be designed in such a

manner as to permit even flow of the pulp. Each portion of the pulp must be bleached for the same period of time. In low density operation slow-moving stirrers will prevent settling or formation of "dead spots". The general consensus is that flow of low density pulp (up to about 8%) should be upwards and that of high density pulp (10 to 15% or higher) in a downward direction. Withdrawal from the retention towers may take place before or after dilution with water. In any event, the pulp should be adjusted to the desired pH after the required bleaching time has elapsed.

While the bleaching of groundwood pulp with peroxides appears to be of foremost interest at this time, hydrogen peroxide can be applied to other pulp types and at different stages of paper manufacture. It has been suggested to spray a hydrogen peroxide solution onto the sheet on the wet or the dry end of the paper machine *(3, 4)*. Such a solution should be only slightly alkaline or neutral to avoid color reversion. It has also been suggested to incorporate suitable hydrogen peroxide solutions in the dried paper sheet which will bleach the sheet upon standing. Such bleaching methods have been tried out but they have been found to be rather expensive. They should not be overlooked, however, since constant improvements are made in the application of hydrogen peroxide and such methods might be suitable in cases where it is difficult to bleach certain pulps to the desired brightness by other methods. This applies to chemical or semichemical pulps as well as to blends with mechanical pulp.

Economical Aspects

The cost of peroxide chemicals is considerably higher than that of bleaching agents of the chlorine group, and, therefore, it seems unattractive from a cost standpoint to simply replace chlorine or hypochlorites with hydrogen peroxide. However, there are a number of conditions where the application of peroxide bleaching is not only economically feasible but the only means of obtaining a bleached product. These conditions may be classified into three groups:

1. Cases where chlorine or hypochlorites may cause undesirable pulp properties.
2. Cases where chlorine or hypochlorites fail to produce a desired bleaching action.
3. Cases where high pulp yields are desired.

The first group comprises the bleaching of chemical pulps. It is well known that it is extremely difficult to bleach certain chemical pulps to a high degree of brightness in the last stages of the process. Excessive amounts of active chlorine tend to deteriorate the fibers by the formation of oxycellulose. This is usually accompanied by a loss of strength and color reversion on storage or heating. It is possible to apply hydrogen peroxide to obtain the desired bleaching results without chemical damage to the cellulose. This fact has been applied very successfully in the textile industry and has resulted in the so-called combination processes (hypochlorite followed by hydrogen peroxide).

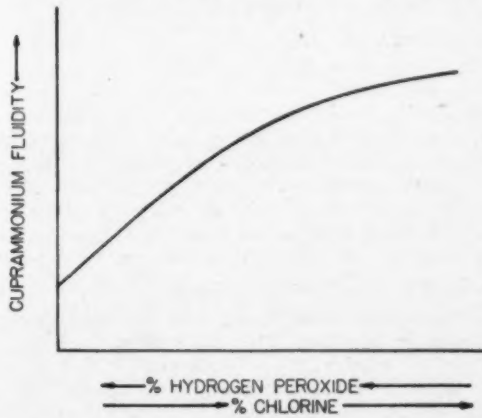

Fig. 1
Effect of Hydrogen Peroxide and Chlorine Bleaching on Viscosity

Studies made on sulphite pulp have shown that fluidity figures are considerably lower on peroxide bleached pulp. Chlorinated and caustic washed sulphite was bleached to the same degree of brightness with varying amounts of active chlorine followed by hydrogen peroxide. With increasing amounts of hydrogen peroxide and decreasing amounts of hypochlorite, fluidities of the bleached pulp dropped.

The amount of hydrogen peroxide used as bleaching agent in the last stages of bleaching chemical pulps may vary from a fraction of 1% to several per cent, and for reasons of economy, a compromise will have to be made in most cases. The object is to obtain the desirable properties inherent to hydrogen peroxide bleaching at the lowest overall cost.

The second and third groups comprise the bleaching of mechanical and semichemical pulps. Peroxides occupy the number one position in the field of groundwood bleaching since no other bleaching agent is known to compare with peroxides in the results obtained. Interest in bleaching of mechanical pulps has grown very much in recent years especially when the industry became aware of the fact that the brightness of groundwood could be substantially increased and that yields of peroxide bleached mechanical pulps were extremely high. In fact, weight losses were found to be almost negligible. The increased brightness makes it possible to use a larger proportion of groundwood pulp in the manufacture of products which formerly were made largely from chemical pulp.

Since the cost of groundwood pulp is considerably lower than that of chemical pulp, part of this price differential can be used advantageously to produce a bleached material suitable for use in the furnish of many types of paper and paper products. The degree of bleaching and the amount of bleached groundwood employed depends to a large extent on the desired properties of the finished product. It is agreed, however, that the lower the cost of bleaching groundwood, the larger will be the demand for it. For this reason, it is of interest to study the factors influencing the cost of bleaching groundwood.

In analyzing this problem, it is found that the cost of bleaching chemicals, the amortization of new equipment, and labor are the main factors. The choice of the equipment is dictated by the bleaching process. Equipment, labor, and chemical costs must be weighed against each other. Once a decision has been reached regarding the type of process, the chemical cost is of prime importance and all efforts should be concentrated on the best utilization of the chemicals.

Application of Hydrogen Peroxide

The choice of the proper bleaching procedure is of the greatest importance. The authors of this paper have studied this question with emphasis on the following points:

1. Maximum brightness increase with a given amount of hydrogen peroxide.

2. As uniform a result as possible from an operational standpoint.

3. The best results in the shortest possible time.

The first and third points are self-explanatory. As far as the second point is concerned, it can not be expected that from different classes of wood, the same final brightness will be obtained with the same procedure. However, an established procedure should be of such a nature as to result consistently in the same degree of brightness increase for the same type of wood pulp.

In order to take full advantage of the bleaching action of hydrogen peroxide, it is of importance to know its behavior under various conditions.

The chemical reactions of hydrogen peroxide are complex. For the purpose of brevity, they are classified into two groups: 1. Bleaching reactions and 2. concurrent reactions.

Since the first reaction is the desired one, all other reactions should be checked as much as possible. A reaction of the latter group is the decomposition of hydrogen peroxide into water and oxygen by catalysts. The most common catalysts for peroxides are copper and iron compounds or substances containing such compounds (catalase, hemoglobin, etc.). Pulps always contain such catalysts, either naturally or in the form of contaminations (for instance, microorganisms, metallic impurities from equipment or water).

A great deal of research has been carried out to study catalytic decomposition of hydrogen peroxide, and to find the most suitable conditions under which bleaching takes place without substantial peroxide losses. It has been found that minute amounts of catalysts under certain conditions are necessary for bleaching. Substances are known which retard the catalytic peroxide decomposition to a very large degree. They are called stabilizers and comprise chemicals such as silicates, pyrophosphates, fluorides, etc. Of these, silicates are the most important because they are inexpensive. Moreover, silicates control the quantity and chemical conditions of catalysts found to be necessary for bleaching.

Other undesirable reactions are brought about by the oxidizing effect of hydrogen peroxide on reducing substances occurring in the pulp. Since, in many cases, these reducing substances react very quickly with hydrogen peroxide, the concentration of hydrogen peroxide is lowered considerably at the beginning of the bleaching period. It is this peroxide loss which can bring about a sudden drop in brightness increment and therefore, erratic bleaching results. This drop may be large or small and depends on the condition of the raw pulp. The elimination of such reducing substances becomes an important factor in economic peroxide bleaching.

In order to eliminate the detrimental influence of hydrogen peroxide consuming substances, these substances must be rendered ineffective *before* the pulp comes in contact with the bleach bath.

A great many ways of doing this have been investigated. Pretreatments of the pulp with alkalies, acids, salts, and a number of other substances, even simple washing, were tried out with some degree of success. Outstanding results were obtained by the application of chlorine in a particular manner. It was found that raw pulp can be "conditioned" for peroxide bleaching by treating it with about 0.5% chlorine (based on moisture-free pulp) at a pH between 5 and 9, preferably between 6 and 7. If care is taken that the raw pulp is uniformly contacted with such a solution, the "conditioning action" takes place almost instantaneously.

It is of interest to note that in most cases the brightness of the "conditioned" pulp is lower than that of the original raw pulp, yet the following peroxide treatment is more effective than without the pretreatment. The following table will illustrate this on groundwood pulp:

	Brightness	
	Conditioned Before Bleaching	Bleached Directly
Raw pulp	58	58
Pulp after "conditioning"	56	..
Bleached pulp	67	64

In this case, three more brightness units resulted due to the "conditioning" treatment, although the bleaching treatment was carried out under otherwise identical conditions. The peroxide treatment was made so effective in its bleaching properties that it not only overcame an initial drop of 2 units but produced an overall brightness increase of 9 units as compared with 6 units where the pulp was not "conditioned".

The amount of chlorine used is very small and yields were found to be substantially the same as without the chlorine treatment, in general, very close to 100%.

Another "conditioning" treatment consists of subjecting the raw pulp to a treatment with mineral acids at a pH of below about 3.0. Such "conditioning" treatments are valuable to increase the stability of the peroxide bleach baths and to obtain high bleaching uniformity.

Other factors must be considered for obtaining the best and most consistent results. Among these are the following: 1. Hydrogen ion concentration, 2. temperature, 3. hydrogen peroxide concentration, and 4. consistency of the pulp.

Hydrogen Ion Concentration

1. The hydrogen ion concentration of the peroxide solution is closely related to its bleaching action. In general, most favorable conditions exist at pH values between 9 and 11. These are values found suitable for peroxide bleaching of most cellulosic materials. At lower pH's, the rate of bleaching is too slow whereas at higher pH's, the rate becomes so fast that it is difficult to control. The desired pH range is obtained by the addition of an alkali, preferably sodium silicate. It is not necessary to add sulphuric acid as in the case of sodium peroxide since hydrogen peroxide does not form free alkali in solution.

Temperature

2. An important factor is the temperature. Both catalytic and oxidation reactions take place at a greater rate with increased temperatures. If the rate is too great, control of the bleaching process becomes increasingly difficult. Experience up to date has shown that suitable temperatures for the bleaching of goundwood pulp are between 30 and 50°C. although small scale tests have shown that bleaching may be carried out at much higher temperatures.

Hydrogen Peroxide Concentration

3. The concentration of hydrogen peroxide in the pulp plays an important part. The concentration may be expressed in per cent hydrogen peroxide, based on the weight of the moisture-free pulp, provided there is the same consistency, e.g., if there is an 0.1% hydrogen peroxide solution in a 3% pulp slurry, the amount of hydrogen peroxide based on its moisture-

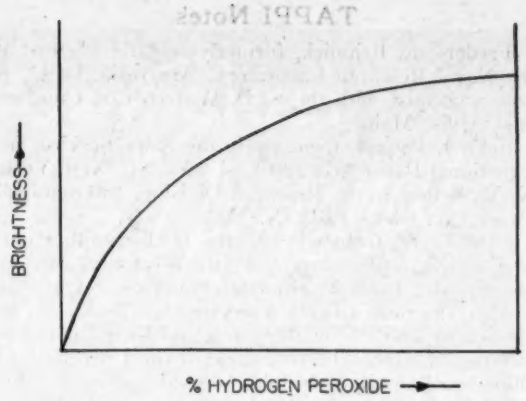

FIG. 2
Effect of Increasing Hydrogen Peroxide on Brightness

free weight is 3.3%. The same solution in a 6% pulp slurry means 1.65% hydrogen peroxide based on the weight of the moisture-free pulp.

It should be borne in mind that commercial hydrogen peroxide solutions do not contain 100% hydrogen peroxide. Therefore, if the amount of hydrogen peroxide is given as per cent based on moisture-free weight, the concentration of the hydrogen peroxide solution should also be indicated, for instance, 2% hydrogen peroxide (35%) based on moisture-free pulp.

With increasing hydrogen peroxide concentrations, the brightness will increase. At lower hydrogen peroxide concentrations, the increase is almost proportional to the increase in brightness. At higher concentrations, the increase in brightness becomes less. This is shown in Fig. 2.

The quantity of hydrogen peroxide necessary to obtain a certain degree of brightness can not be predicted accurately. A great many factors enter into this question. Among these are type of wood, location of wood, age of wood and pulp, natural impurities, impurities caused by equipment and water, and methods of peroxide application. However, a number of factors have been established. Based on the same bleaching procedure, brightness increases on freshly prepared pulp are, in general, larger than on pulp which had been subjected to storage. A larger brightness increase is obtained on spruce, balsam, and poplar than on pine or Western hemlock. Pulps made from logs infested with certain fungus growth ("blue stain" on Southern pine) offer a considerable resistance to peroxide bleaching.

PULP CONSISTENCY

4. Consistency of the pulp. This has been found to be one of the most important factors in hydrogen peroxide bleaching especially for bleaching groundwood pulp. This factor has a decided influence in obtaining the highest degree of bleaching with a given amount of hydrogen peroxide. The importance of this factor has not been pointed out sufficiently in the past and it should be given the greatest consideration. From a practical standpoint, it would be desirable to bleach the raw pulp at the consistency at which it is received from the deckers. In most cases, consistencies are in the neighborhood of 3 to 5%. However, it has been found that bleaching at higher consistencies is of great beneficial effect.

In a series of tests, groundwood pulps of various consistencies and with an original brightness of 52.8 units were prepared and bleached with the same percentage of hydrogen peroxide (based on moisture-free weight). After a suitable pretreatment, the material was treated for a period of 1 hour with the bleaching chemicals. The following table shows average brightness increases (Δ B) at various consistencies.

Consistency	Δ B
3	4.0
6	6.4
9	7.5
12	8.6
15	9.4
18	10.1
25	11.9
40	13.0

The bleaching temperature in these cases was 38 to 40°C. and differences in Δ B are on the order of over 300% for the same chemical cost. This remarkable effect, because of consistency increase, can be explained if it is remembered that increasing hydrogen peroxide concentration is one means of increasing brightness. This has been achieved by increasing the consistency of the pulp, rather than by increasing the percentage of hydrogen peroxide used based on moisture-free weight. Brightness increases of from 10 to 15 points may be obtained with 2% hydrogen peroxide (27.5%), provided all other conditions are favorable.

It is important that the rate of the peroxide consumption is controlled in order to obtain the best results. Controlling factors are: suitable pretreatment which increases the overall stability of the bleach bath consistency and temperature, both of which control the rate of bleaching. Changes of temperature can be utilized in such a manner as to bleach pulp from a few minutes up to several days. The higher the temperature, the greater the rate of bleaching. The following are examples:

Suitably "conditioned" pulp of 25% consistency containing 2.0% hydrogen peroxide (27.5%) and 8% silicate of soda (26.0% SiO_2 and 10.5% Na_2O) was split into three equal parts: A, B and C. Part A was allowed to stand at 20°C. Part B was treated at 40°C, and Part C was subjected to an atmosphere of steam at 100°C. After 7 days, Part A showed a brightness increase of 9 units and a certain amount of hydrogen peroxide was still left. Part B showed a brightness increase of over 12 units in 1 hour, and Part C, an increase of 10 units in only 12 minutes!

If the bleaching time is extended after the hydrogen peroxide has been consumed, color reversion takes place, slowly at lower temperatures and more rapidly at higher temperatures. Therefore, the temperature used in any given mill must be carefully planned from existing facilities. Where time allows, peroxide saturated laps may be stored at room temperature until the highest brightness increase is obtained. Bleaching in 1 to 2 hours may be carried out at 35 to 45°C. Since bleaching times at a temperature of 60°C. and above should not be extended beyond the required lengths in order to prevent color reversion, such a bleaching procedure should be carefully controlled.

After the required bleaching time, the laps or crumbs are brought to lower density and at the same time, the pH is reduced with acid or acidic material before the pulp is sent to the machine chests or to the beaters.

The methods of applying chemicals to pulps of high consistencies is now under investigation and the results will be reported at a later date.

Cost of Bleaching Groundwood

Since brightness increments upon bleaching vary

with the type of pulp and local conditions, the chemical cost of bleaching will naturally vary. Bleaching of groundwood made from New York State spruce shows an average increase of about 8 points by the use of 0.75% hydrogen peroxide (35%). The total chemical cost to obtain such an increase is approximately $4.80 per ton of pulp or about 60 cents per point per ton.

Greater brightness increases are somewhat more expensive on a point basis. However, since paper containing bleached groundwood pulp shows less color reversion on the machine than that containing unbleached groundwood pulp, the cost per point based on the finished paper will be even lower.

Literature Cited

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2. Reichert, J. S., *Paper Trade J.* 120, No. 15: 43-48 (April 12, 1945).
3. Heritage, C. C., U. S. pat. 2,125,634.
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High Polymers

The first volume in a series on Advancing Fronts in Chemistry—High Polymers, edited by Sumner B. Twiss of Wayne University, has been issued by the Reinhold Publishing Company. This volume (196 pp. 6 x 9½) contains a correlation of recent and diverse information on this subject. Subjects covered include: Molecular Structure and Mechanical Behavior of High Polymers by Herman F. Mark, The Relation Between Structure and Physical Properties of High Polymers by Samuel S. Kisler, Some Applications of Catalysis to Hydrocarbon Reactions of Importance in the Synthesis of High Polymers, by Edgar C. Pitzer, Some Aspects of the Mechanism of Addition Polymerization, by Charles C. Price, Polymerization as a Study of Reactions of Free Radicals, by Frank R. Mayo, Molecular Size Distribution in High Polymers by Walter H. Stockmayer, Effect of Chain Length on Physical Properties of Cellulose Derivatives by Emil Ott, Nature of the Solid State of Chain Polymers, by William O. Baker, Mechanical Properties of Concentrated Solutions of High Polymers, by John D. Terry and Some Concepts of Textile Fibers, by Milton Harris.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $4.00 per copy.

Piping Handbook

The McGraw-Hill Book Company has recently issued the Fourth Edition of the Piping Handbook by Sabin Crocker of the Detroit Edison Company. (1376 pp., 7¼ x 4½). This is an authoritative and accessible data book for engineers interested in piping design in power plants, distribution systems and in industrial operation.

Among the subjects covered are: properties of fluids, metallurgy of piping materials, pipes, valves, fittings, heat insulation, hangers and supports, steam power-plant piping, building heating systems, plumbing systems, water-supply piping, fire protection piping, corrosion, and hydraulic power transmission piping.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $7.00 per copy.

TAPPI Notes

Frederic E. Brinnick, formerly research chemist at the Naval Research Laboratory, Anacostia, D. C., is now a chemist with the S. D. Warren Co., Cumberland Mills, Maine.

Leon J. Paquin, formerly in the Sales Service, International Paper Co., 220 East 42nd St., New York, N. Y., is now in the Research Division, International Paper Co., Glens Falls, N. Y.

Paul Torre, formerly with the H. P. Smith Paper Co., Chicago, Ill., is now in the Technical Service Department, Corn Products Refining Co., Argo, Ill.

The American Chemical Society has issued an invitation to TAPPI members to attend their November meeting, at which Dr. Johnstone of the University of Illinois will speak on sulphur dioxide. The meeting will be held November 19th at Science Hall of Lawrence College, Appleton, Wis., beginning at 8 p.m. Reservations for dinner at the Candleglow may be made through John Wollwage, Kimberly-Clark, Neenah, Wis.

Kieth Gainer, former TAPPI Fellow in Finland is now with the International Paper Company, New York, N. Y.

Axel Ekwall, formerly with Korsnas A/B and Billeruds A/B is now Technical Attache with the Swedish Legation, Commercial Department, 630 Fifth Ave., New York 20, N. Y.

Maurice O. Neilson, formerly of the Alliance Paper Mills, Ltd., is now a consulting engineer at 130 Duchess Street, Toronto, Ont.

Frank D. Libby is now Manager of Manufacturing of the Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.

A. A. Alfsen, formerly Mechanical Engineer for the American Defibrator, Inc., is now manager of the Lulea and Byske Mills, Munksunds A/B, Lulea, Sweden.

The Niagara Group of the TAPPI Empire State Section will meet at the Prospect House, Niagara Falls, N. Y. on November 14th. Norman Weil of the W. S. Tyler Company will discuss fourdrinier wires.

The TAPPI and New England Section will meet at the Roger Smith Hotel, Holyoke, Mass. on November 16th.

The TAPPI Ohio Section will meet at the Manchester Hotel, Middletown, Ohio, on November 8th. Tub Sizing Studies will be the subject discussed.

Individuals or companies wishing to present papers at the annual meeting of the Technical Association of the Pulp and Paper Industry, Commodore Hotel, New York, N. Y., on February 25-28, 1946, should communicate with the Secretary, R. G. Macdonald, 122 East 42nd Street, New York 17, N. Y. without delay. New York will be congested during this week because of the Exposition of Chemical Industries to be held at the same time. Reservation priority will be given at the Commodore to members of the Technical Association if they will so indicate but this can be done only if the reservations are sent in as soon as possible.

The TAPPI Lakes States Section will meet at the American Legion Club House, Appleton, Wis., at 6:30 p.m. on Tuesday, November 13th. Another group discussion is planned, with starch as the subject. Dr. Martin L. Downs of Thilmany Pulp and Paper Company will act as discussion leader, and other members of the panel will be J. P. Casey of the Paper Mill Department of A. E. Staley Manufacturing Company, Dr. J. E. Killinger of Penick and Ford, Ltd., and J. P. Strasser of Stein, Hall and Company.

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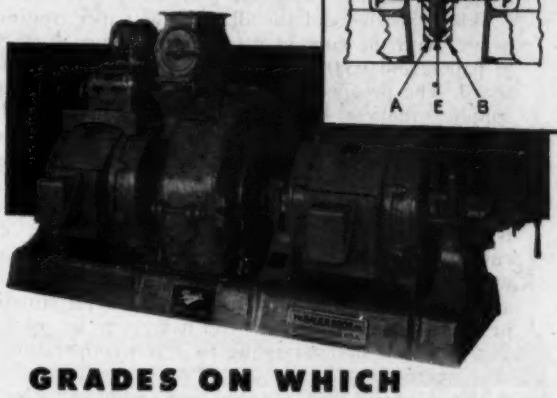

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New York Paper and Pulp Market Review

Production of Paper Continues High But Under Heavy Demand—OPA Considering Higher Newsprint Price—Pulpwood Supply Off and Lack of Woods Labor Serious—Mills Need More Waste Paper.

Office of the PAPER TRADE JOURNAL,
Wednesday, November 7, 1945.

Wholesale demand for all types of paper continues heavy, with the current rate of production at 95.8% in paper, and 93.0% of estimated capacity in paperboard. The prospect of a steady improvement in the supply situation continues favorable, despite labor difficulty in Fourdrinier wire weavers and the slow backward movement of labor to the industry. Lack of labor is currently reported more acute in the production of paperboard. Labor and labor productivity is the current industrial problem now widely discussed; many concerns reporting the efficiency per worker is far below the pre-war average, while costs are considerable higher. This is the general situation prevailing in all industries and has yet to be resolved in a practical understanding to attain cooperation of all concerned.

Paper production for the first eight months of 1945 totaled 5,515,000 tons, compared with 5,469,000 tons in the like period in 1944, an increase of 0.8%. Of this total paperboard comprised 6,004,000 tons in 1945, and 5,997,000 tons in 1944, an increase of 0.1%.

The index of general business activity for the week ended October 27 rose to 118.9, from 115.3 in the preceding week, compared with 137.3 for the corresponding period in 1944. The index of paperboard production was 145.9, compared with 142.7 in the preceding week, and with 128.5 for the corresponding week in 1944.

Paper production for the week ended October 27 was estimated at 95.8% compared with 91.3% for 1944, with 88.5% for 1943, with 92.9% for 1942, and with 108.6% for the corresponding week in 1941.

Paperboard production for the week ended October 27 was 93.0%, compared with 95.0% for 1944, with 94.0% for 1943, with 84.0% for 1942, and with 99.0% for the corresponding week in 1941.

Newsprint order of newspaper publishers are expected to be reduced 15%, the WPB stated in a late report. Accumulated over-orders for the fourth quarter is the cited reason.

A higher newsprint price is under consideration by the OPA, to stimulate production. The agency estimated that a $5 per ton increase would result in a $16,000,000 annual cost to newsprint consumers in the U. S. The increase would go into effect the first of the year and would apply to all newsprint sold in this country. The current price of newsprint is $61 per ton at 38 port cities, with additional delivery charge allowances varying for the ten different zones in the United States.

Pulpwood

Pulpwood continues tight and without more workers returning to the woods, the prospect for an adequate supply is unfavorable. Mill receipts totaled 11,651,000 cords for the eight months of 1945, compared with 11,749,000 cords in 1944 and with 10,000,000 cords in 1943. Receipts of domestic produced wood totaled 10,502,000 cords in 1945 in the eight-month period, compared with 10,660,000 cords in 1944, a decrease of 1.5%.

Wood Pulp

Wood pulp production in August was 26,000 tons above July: total output for the eight months of 1945 was 6,871,000 tons, compared with 6,688,000 tons in 1944, an increase of 2.7%; imports, 766,000 tons, compared to 718,000 tons in 1944, an increase of 6.7%; consumption, 7,441,000 tons, against 7,287,000 tons in 1944, an increase of 2.1%; exports, 123,000 tons, against 134,000 tons in 1944, a decrease of 8.2%, and inventories totaled 425,000 tons, compared with 390,000 tons in 1944, an increase of 9.0%.

Rags

Papermaking grades of new cotton rags continue in active demand, with many mills unable to procure all the tonnage required. The supply situation in white shirt cuttings and in bleached muslins and underwear cuttings is tight, with more supplies expected when the cutting up trade operates at a higher rate. This improvement is slowly developing.

Old cotton rags are in active demand. Reports still indicates roofing mills are unable to procure all the roofing grades required. Prices are firm and unchanged.

Old Rope and Bagging

Mills report they are unable to procure all the old Manila rope required, but there is no relief short of importations of new fiber. Sisal and jute are in good demand at this date. Prices are firm.

Restrictions on domestic special sales of agave rope have been revoked by Amendment 1 to Priorities Regulation 13. The amended regulation no longer permits exports without authorization, when the total amount is under 5,000 pounds. A special sale is defined as a sale by any person or government agency, who acquired any product for use and not for resale.

Bagging sales continue limited. No. 1 gunny leads this market with moderate volume. Scrap bagging still is slow. Prices are unchanged.

Old Waste Paper

Mill demand for all grades of paper stock is strong. The short supply in folded news and in old corrugated continues. Prices are strong at ceiling levels.

Gammie Opens Own Plant

HOLYOKE, Mass., October 5, 1945—William A. Gammie of Brightwood avenue, has resigned as plant manager of the Sinclair Company to strike out in business for himself in the paper mill wire field. He has leased space at 79 Merrick avenue. His plant will make cylinder rolls, dandy rolls and wood rolls. He plans to establish a service to recover cylinder molds and dandy rolls at the mills.

Gammie is well known in the wire and wire and paper industry. He has been prominently identified with many of the major improvements in welder wire-seaming in the dandy roll and fourdrinier wire field. For the past 17 years he was with Sinclair Company.

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, November 7, 1945.

BLANCE FIXE—The market for blanc fixe is reported unchanged for the week. Current demand continues fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton.

BLEACHING POWDER—Demand is currently reported active. August output of 1,699,000 lbs. below July. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point. Imported, 21 to 23 cents per pound. All requests filled.

CAUSTIC SODA—Supply situation continues short. electrolytic output for August lower at 92,057 tons. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for some grades of china clay is reported fair this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Supply tight. August output of 97,645 tons below July. Essential requirements met. Prices unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Offerings and sales light at OPA prices: "G" gum rosin at $6.74 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $6.70 per 100 pounds in barrels, New York. Average price of 70% gum rosin size is currently offered at $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Demand reported moderate. Quotations on salt cake continue to remain unchanged. Domestic salt cake is currently quoted at $15 per ton; chrome cake at $16 per ton.

SODA ASH—Market demand for soda ash continue heavy. Output of light ash for August lower at 188,086 tons. Strikes delay deliveries. Prices continue unchanged. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Market supply of cash corn higher this week but under last year. Shipments fair. Corn prices are steady. Starch quotations continue unchanged. Pearl is currently quoted at $3.72 per 100 pounds. The powdered grade is currently quoted at $3.83 per 100 pounds. All prices f.o.b. Chicago.

SULPHATE OF ALUMINA—Supply situation reported favorable. Quotations are unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported active for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract prices at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—The market for domestic talc is reported fair this week. Quotations unchanged. Domestic grades are quoted at from $16 to $21 per ton, at mines. Canadian $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

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Sheets	69.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Li. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext.				
No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	32.20 "	37.75	33.35 "	39.25
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.00 "	27.00	24.15 "	28.25
65% Rag	.... "	....	22.80 "	27.75
50% Rag	18.70 "	22.75	19.90 "	24.25
25% Rag	16.40 "	20.00	17.55 "	21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$10.55	@ $12.75	$11.70	@ $14.25
No. 2	9.65 "	11.75	10.80 "	13.25
No. 3	9.20 "	11.25	10.35 "	12.50
No. 4	8.90 "	10.75	10.05 "	12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.35
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.10
No. 4 Glossy Coated	11.15	"	12.70
No. 1 Antique (watermarked)	10.25	"	11.70
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.70
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.10
B Grade S. C.	9.10	"	10.30
C Grade E. F.	8.55	"	9.70
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.30
D Grade S. & S. C.	8.50	"	9.70

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.00
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich .72.00	@ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	73.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

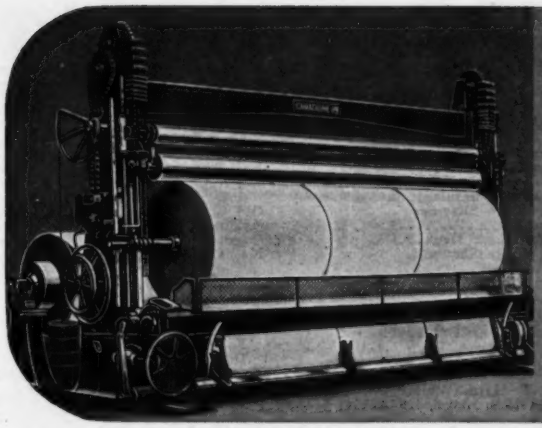
Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices



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CAMERON 19 Winder is built in widths up to 192". Runs at speeds up to 2800 f.p.m. on paper or 1500 f.p.m. on board. Winds rolls to diameters up to 40" on paper or 60" on board. Write for interesting folder.

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61 Poplar Street Brooklyn 2, N. Y.
Midwest Office: 111 West Monroe St., Chicago 3, Ill.

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CHLORINE
CAUSTIC SODA
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Carbon Bisulphide
Carbon Tetrachloride
Citric Acid
*Copperas
Cream of Tartar
Muriatic Acid
Nitric Acid
Silicon Tetrachloride
Sodium Hydrosulphide
Stripper, Textile
Sulphur
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Sulphur Chloride
*Superphosphate
Tartar Emetic
Tartaric Acid
Titanium Tetrachloride
(*Items marked with star are sold on West Coast only.)

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NIAGARA DIVISION
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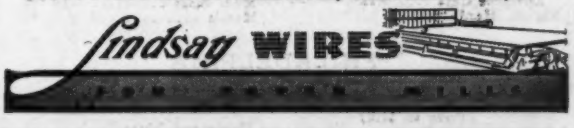
424 Ohio Bldg., Akron 8, O. — Orlando, Fla. — North Portland, Oregon — Houston 2, Texas

"A small drop of ink falling like dew upon a thought produces that which makes thousands, perhaps millions think."
—LORD BYRON

IT is in the spirit of this quotation that we at Lindsay have woven wire cloth for more than 40 years. We believe that no so-called detail is too small to demand careful attention.

THE LINDSAY WIRE WEAVING COMPANY
Serving the Paper Industry Since 1903
14001-14299 ASPINWALL AVE., CLEVELAND 10, O.

Lindsay WIRES



EXCELSIOR Woolen Co. Camden, Me. FELTS & JACKETS

"EXCELSIOR" FELTS

Manufacturers of Felts of Superior Quality for Every Grade of Pulp and Paper

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03¼
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—			
Sisal Strings	.04	"	—
No. 2 Clean bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.03½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02½	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.30	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.35	"	—
No. 1 Roofing Bags	1.45	"	—

Price & Pierce Ltd.

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for domestic and export

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THIS U-BAR USED EXCLUSIVELY
in
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25 of which were 12'Dx45'L
SOLD IN U. S. A. *and* CANADA LAST 2 YEARS

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Worn Rollers Re-Engraved.

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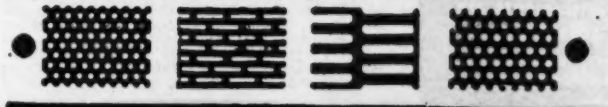
SCREENS of Perforated Metal



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— PAPER MACHINERY —

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NOW—It is our responsibility to co-operate in the molding of an ENDURING PEACE.

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MANUFACTURING COMPANY
SOUTH WINDHAM, CONNECTICUT

Solicit your inquiries for REPAIRS or NEW EQUIPMENT which will receive our prompt attention as rapidly as controlled materials and skilled labor are made available.

— PAPER BAG MACHINERY —

The New Model "E" Paper Trimmer.

HELP WANTED

PAPER SPOOL MAKER

We are looking for an experienced man capable of buying the necessary machines and setting up a small department to make paper spools for our own use.

Must be willing to undertake the job on a flat fee basis.

SLATER BROTHERS, Inc.
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N-8

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ENGINEERING DRAFTSMEN

For design and development of insulation board mill equipment and allied machinery. Permanent position. Experience in design of paper mill equipment helpful but not required. Location South. State availability with complete details of experience.

Address Box 45-726 care Paper Trade Journal. J-3

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Chemist or engineering graduate, about 28 to 34 years age, with mill or technical paper background, for sales service and marketing of sizing and emulsion products. Applicant's headquarters to be in vicinity Boston for traveling East Coast. Splendid opportunity with nationally known company. Write full qualifications and references including recent snapshot. Box No. 45-425 care Paper Trade Journal. N-15

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EXPERIENCED SALESMAN

on Fine Papers including Rag Content Papers. Good opportunity for right man to become Assistant Sales Manager after a short period. Address Box 45-725 care Paper Trade Journal. N-22

TOUR BOSS

Wanted for Mill with two small machines. Must be fully experienced in making of Rag and Sulphite Papers in Cover, Blotting and Text Papers. Experience in making of wide range of colored papers essential. Replies treated confidentially. Address Box 45-721 Paper Trade Journal, giving age, experience, family status, etc. N-29

DEVELOPMENT ENGINEER

Experienced in groundwood, sulphite, sulphate, papermill operation and control. Familiar with tub sizing, use of starches, glues, proteins, wet strength resins, waxes, wax emulsions. Know bleaching and stock preparation. Experienced in process development and development of special use papers. Now in service expecting immediate release. Address Box 45-698 care Paper Trade Journal. N-22

SALES ENGINEER with knowledge of Pulp and Paper Machinery and experience in merchandising. Write giving background, references and salary expected. Address Box 45-606 care Paper Trade Journal. I F

WANTED — Cost Accountant — Middle West Box Board Mill. Give age, experience and salary expected. Address Box 45-727 care Paper Trade Journal. N-29

HELP WANTED

CHARLES P. RAYMOND SERVICE
294 Washington St., Boston Mass.
Specializing in Paper Mill Personnel
Positions Now Open
Superintendent set-up paper box and paper board converting plant
Board mill superintendent
Designers and draftsmen $350-450 month
Paper salesmen (three)
Plant and mechanical engineers, master mechanics
Tour boss (several)
We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. N-8

PULP AND PAPER ENGINEER

Many years research development and practical operating experience in the pulp and paper industry.

Have perfected method of reducing production cost and improving pulp quality.

Installation will pay for itself in a short time.

Have been employed as Consulting Engineer by large company for period of years.

Looking for connection with concern which desires to increase profits.

Prefer medium size plant having sulphate or soda process.

Address Box 45-711 care Paper Trade Journal. N-8

CLASSIFIED ADVERTISING

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—5c a word. Double rate for heavy face type. Minimum charge $1.25.

WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

OPPORTUNITIES—5c a word. Double rate for heavy face type. Minimum charge $1.25.

Classified advertising space may also be purchased at $3.00 per single column inch.

All classified advertisements are payable in advance.

If box number is used—35 cents additional.

Address Replies

to advertisements appearing under Box Numbers in care of
PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

HELP WANTED

WANTED

Draftsmen and Designers on Paper-Machinery, excellent wages, pleasant working and living conditions.

Write or phone 1200
BAGLEY & SEWALL COMPANY
Watertown, New York

N-15

PAPER MILL SHEETER

Exp'd. operator on Hamblet sheeter. Late model overlap system and automatic lay-boy. Steady employment, good wages. Apply or write

BEACH & ARTHUR PAPER CO.
Modena, Pa.
(2 miles south of Coatesville.)

N-8

WANTED

Graduate Chemist or Chemical Engineer with a technological background in the field of emulsions. Special consideration will be given to an individual with experience in the development and manufacture of wax and resin emulsions. This is an excellent opportunity for a man qualified for the position. Write fully of experience and qualification. Replies will be treated confidentially. Box 45-663 care Paper Trade Journal. N-8

SALARIED POSITIONS

$2,500-$25,000. Reconversion is creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Delward Bldg., Buffalo 2, N. Y. TF

CHIEF ENGINEER — Expert Master Mechanic and machine shop superintendent. Inventor and designer of papermaking and paper converting machinery, and processes. Supervisor of building construction, plant maintenance and plant layout. Expert on wage incentive, time study, production control, efficiency and cost control methods. Have built complete mills. Good executive and organizer. Open for engagement soon. Box No. 45-710 care Paper Trade Journal. N-15

WANTED—Assistant Superintendent for New England Wall Paper Factory. State experience in paper coating and surface printing. Give full information in letter. Address Box 45-731 care Paper Trade Journal. N-22

MACHINE DESIGNER preferably with experience on paper mill or paper working machinery for a permanent position. Location Phila. area. Please give complete details, age, experience, etc. Address Box 45-732 care Paper Trade Journal. N-29

PERU, SOUTH AMERICA—Opening for experienced Tour Boss under 50 to work on cylinder and fourdrinier machines in a board and tissue mill; three year agreement; transportation and modern homes provided for employees and families; special school for younger children; moderate climate. Address Box 45-733 care Paper Trade Journal. N-22

BACKTENDERS — FOURDRINIER MACHINES. SEVERAL OPENINGS IN FINE PAPER MILL MAKING RAG AND SULPHITE PAPERS AT SPEEDS UNDER 200 FEET. GIVE COMPLETE DETAILS OF AGE, FAMILY STATUS, EXPERIENCE AND GRADES HANDLED. ADDRESS BOX 45-722 care Paper Trade Journal. N-29

BUILT ON YOUR DESK—and custom built at that!

It's a fact that paper machines are custom built to the 'nth degree, because into each machine must go the experience of many men modified to meet the new conditions. Their will—working on the materials of memory; not satisfied with following the order prescribed by precedent or suggested by accident, but selecting the parts of different conceptions, or objects of memory, to form a *new* machine, more pleasing and decidedly more efficient.

Thus it is that no existing machine will entirely meet *your* requirements. Thus it is that Black-Clawson engineers are eager to sit across your desk and step by step aid in planning your new machine. You owe it to yourself to consult their memory and logic. No machine too small; no machine too large—to warrant their presence.

And when the design has been decided upon—Black-Clawson has the facilities to bring it into tangible form.

THE BLACK-CLAWSON CO., Hamilton, Ohio

Divisions: **Shartle Brothers Machine Co., Middletown, Ohio; Dilts Machine Works, Fulton, N. Y.** ***Associate:*** **Alexander Fleck Limited, Ottawa, Canada**

HELP WANTED

WANTED—Machine Tenders, Backtenders, Windermen and Beater Engineers for cylinder machine making .009 Board, .016 Jute Liner and Imitation Kraft Wrapping Paper. Must have experienced men. Sangamon Paper Mills, 3915 S. LaSalle Street, Chicago, Illinois. N-8

CHEMIST having several years practical paper mill experience for paper research development, and control work, with large manufacturer of diazo sensitized reproduction papers. Give complete information regarding education, pertinent personal data and references in first letter. Address Box 45-665 care Paper Trade Journal. N-8

WANTED—Draftsman and Designers on Paper Machinery. Excellent wages, pleasant working and living conditions. Write or phone 1200. Bagley & Sewall Company, Watertown, New York. N-8

WANTED—Lining Machine Operator having experience with latest methods of lining all types papers to boxboards using dextrine and thermoplastic adhesives. New lining department recently established with new equipment. Need operator who can get good production as well as highly quality. Midwest location. Address Box 45-678 care Paper Trade Journal. N-15

WANTED—MACHINE TENDERS with experience on cylinder tissue and on stock preparation and in handling men. Modern mill located in Connecticut. Address Box 45-699 care Paper Trade Journal. N-8

WANTED — ENGINEERS — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. TF

HELP WANTED

MACHINE DESIGNER preferably with experience in paper mill or paper working machinery. Permanent position with good opportunity advancement. Location Brooklyn, New York. State complete details, age, experience and salary expected. Address Box 45-578 care Paper Trade Journal. TF

WANTED—One man to represent an Eastern paper converting mill through New York State. We will prefer one who has had some experience in paper sales, and who resides in the vicinity of Syracuse, N. Y. Address Box 45-596 care Paper Trade Journal. D-20

ESTIMATOR—Experienced in all phases of folding cartons, including paraffined cartons and specialties. Excellent opportunity for right person with one of this industry's most progressive firms. Write, giving complete details in first letter, stating experience, age and salary expected. EMPIRE BOX CORPORATION, GARFIELD, N. J. N-15

WANTED—Millwright-Machinist — capable of taking complete charge of wall paper factory in New England. State experience with paper converting machinery and drying equipment. Give full information in letter. Address Box 45-700 care Paper Trade Journal. N-15

TOUR BOSS wanted to be trained for job of Assistant Superintendent of Roofing Felt Mill located in New Orleans. Send complete resume giving experience, etc. to Box 45-717 care Paper Trade Journal. N-29

HELP WANTED

WANTED—Engineer Draftsman or Machine Designer with experience, machine builders preferable or super or finishing calenders. Excellent opportunity with old, well established company. Location—Wisconsin. State age, qualifications and salary expected. Address Box 45-424 care Paper Trade Journal. N-15

SITUATIONS WANTED

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-658 care Paper Trade Journal. N-8

SUPERINTENDENT — Asst. Supt. — Age 33. Twelve years practical experience on roofing felt. Thoroughly experienced in production and supervision. College-technical background. Available on short notice. Address Box 45-690 care Paper Trade Journal. N-8

YOUNG MAN—EXPERIENCED OPERATOR ON THE FOLLOWING MACHINES: LAMINATING, GUMMING, COMBINING, WATERPROOFING, SHEETING, SLITTING, ROLL PRINTING, ETC. ALSO HAS COMPLETE KNOWLEDGE ON BUILDING AND REPAIRING SAME. WISHES POSITION WITH RELIABLE PAPER CONCERN. Address Box 45-688 care Paper Trade Journal. N-22

FOR SALE

BEATERS
2—2000 lb. Holyoke Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—60" 4-roll Downingtown (heavy duty).

CENTRAP
1—Shartle Brothers Centrap.

CONVEYORS
650'—3½" Roller Conveyor Section—18"x10'.
1—All Steel Construction. Electric operating used Conveyor. 68 linear feet, with a moving apron 48" wide.

CYLINDER MOULDS
1—48" Diameter x 96" Face.
8—30" diameter x 72" face.

DIESEL ENGINE
1—60 H.P. Fairbanks Morse Diesel Engine, connected to a 40 KVA Generator.

DRIVES
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—Pulmax Drive.
1—#7½ Reeves Drive.

DRYERS
23—36" diameter x 82" face.
12—36" diameter x 68" face.
13—60" diameter x 154" face.
1—48" diameter x 94" face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSATORS
2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
1—18 plate Flat Screen, with scraper.
1—12 plate Flat Screen.
2—12 plate Packer Type Flat Screens with steel vats

JORDANS
1—#2 Miami Jordan.

JORDANS
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor — requires use of 400 H.P. motor.
1—Smith & Winchester.

MOTOR
1—150 H.P. G. E. Induction Motor—3/60/220-875 r.p.m.—including starting equipment.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
1—Shartle Brothers—8 x 18.
1—Moore & White triplex 10 x 12 stock pump.
3—Worthington Turbine Well Pumps—300 g.p.m. for 14' and 16' depths—with motors.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—110" face.
1—3 Drum Reel—72" face.

REFINERS
2—#1 Claflin Refiners.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

SAVEALL
1—Saveall 36" x 136" cylinder mold, antifriction bearing equipped, including couch roll.

SCREW PRESS
1—Valley Iron Screw Press.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS
1—103" Hamblet Single Knife Sheeter, complete with slitting device.
1—110" Horne single knife rotary sheet cutter.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—60" Hudson Sharp two shaft Slitter & Winder.
1—72" Kidder two drum Slitter & Winder.
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder
1—116" 4 drum Moore & White Slitter and Winder.
1—60" Moore & White Slitter and Winder set for 5/8" slits.
1—60" Moore & White Slitter and Winder set for 7/16" slits.
1—72" Moore & White shaft winder.
1—4 Drum 108" trim Moore & White.

STACKER
1—Lewis Shepard—1000 lb. capacity—12' lift—motor included—Equipped with safety devices.

STEAM ENGINE
1—100 H. P. Ames Steam Engine connected to a 75 K. W. Westinghouse Generator.

SUCTION BOXES
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

TOILET CONVERTER
1—63" Dietz Toilet Converter.

TRIMMER
1—40" Brown & Carver Trimmer.

WET MACHINE
1—84" 2 press Wet Machine.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

Wanted Cylinders and Fourdrinier Machines (complete mills). What have you to offer?

J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey
TEL. BIGELOW 3-3720 N-8

FOR SALE

FOR SALE

FOR SALE

Ross Paper Machinery Co., 265 Passaic St., Newark 4, N. J., Humboldt 2-2177

BEATERS
1—2500 lb. Downingtown Iron Tub.
1—750 lb. Downingtown Iron Tub.
2—1000 lb. Horne Iron Tub.
1—1200 lb. Holyoke Wood Tub.

CALENDER STACKS
1—11 roll Pusey & Jones. 104" face.
1—9 roll Rice Barton 99" face.
1—3 roll Moore & White 86" face.

CONVERTING EQUIPMENT
2—Hudson Sharp 63" Slitters and Folding Machines for converting facial tissue. With motors and starters.
1—Dietz 65" Toilet Converter. With motor and starter.
1—64¾" Hudson Sharp Toilet and Toweling converter. With motors and starters.
3—Sanitary Napkin Machines. With motors and starters. Capacity 105 pads per minute each.
1—Bliss Double Head Stitcher.
1—Bliss Single Head Stitcher.
1—Bliss Box Assembling Machine.
1—66" Dietz Towel Winder.
4—Waterville Grinders.
1—36" Waldron Reeling Machine.
1—39" Dampening Machine.
1—36" Brush Coating Machine.
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets.

CONVEYOR
1—Standard Conveyor 30' long on wheels for handling bales of pulp. Direct connected to 5 h.p. motor.

DRYERS
1—48" diameter x 88" face.
4—60" diameter x 174" face framed and geared.
1—36" diameter x 102" face with bearings.
19—36" diam. x 68" face—2 deck frames, gears, bearings, etc.
40—36" diam. 86" face 3 deck frames.
18—36" diam. 82" face 2 deck frames.
40—28" diam. 96" face 2 deck frames.

FESTOON DRYERS
100" Proctor & Schwartz
60" Proctor & Schwartz

FLAT SCREENS
1—Moore & White 8 Plate.
1—Moore & White 10 Plate.
2—Sandy Hill Packer 8 Plate Scrapers.
1—Sandy Hill Packer 10 Plate.
1—Trimbey Pulp Screen 30 ton cap.

JORDANS
1—Dillon No. 2 Motor drive.
1—Appleton No. 2 motor drive.

KNIFE GRINDER
1—72" Seybold automatic used one year.

MISCELLANEOUS
700—Carmeron slightly used Slitter Knives—$1.00 each. Purchased from a war cancellation.
2—Yankee Dryer doctor oscillators (Beloit)
2—Nugeat Oil Filters (new).
2—Beloit Fourdrinier Shakes.

MOTORS
5—1000 h.p. motors, 2300 volts with all controls.
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 h.p. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face.

PULLEYS
185—Cone Lift and Solid Cast Iron Pulleys. *Various Sizes.*

PULP EQUIPMENT
Complete Ground Wood Mill—
5—Sandy Hill four pocket Grinders. Each direct connected to 1000 h.p. motor, 2300 volts. 27" stones. Spare stones, etc. Excellent condition. Will sell all or part.
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure.
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure.
3—Improved No. 2 Knotters.
1—Nichols-Herreshoff Lime Kiln.
1—Williams No. 30 Bark Hog.
1—Sumner Disc Barker 72" dia.
1—36" Bauer Bros. Single Revolving Disc Mill. Direct connected to 50 h.p. motor, 3 phase, 60 cycles, 220 volts, 1160 r.p.m.

PULPERS
1—E. D. Jones direct connected to 60 h.p. motor with starting equipment.
1—Sturtevant Bale Pulper with conveyor & motors used three years.
1—Voith Pulper No. 1-20 tons cap.

PUMPS
1—Frederick 400 g.p.m.—60' head.
1—Pusey & Jones 5" x 8" Stock.
1—DeLaval 6" x 6".
1—Oliziti Acid 3" Suction.
1—Frederick 600 g.p.m. 50' head (stock).
1—Midwest 6" stock pump.

REELS
2—Pusey & Jones 104" face 18" dia. bowls.
1—Pusey & Jones 115" face 18" dia. bowls.
1—2-bowl 100" face 20" dia. bowls.

REFINER
1—10" Wiener Refiner with Regulating Valves.

RIGHT ANGLE WORM GEAR DRIVES
1—Cleveland 2 H. P.—10 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.
1—Oliver 5 H. P.—51 to 1 ratio.
1—Grant 2 H. P.—3¼ to 1 ratio.
1—Cleveland 2.3 H. P.—40 to 1 ratio.
1—Cleveland 1.2 H. P.—60 to 1 ratio.
1—Grant 2 H. P.—7 to 1 ratio.
1—Philadelphia 2 H. P.—600 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.

ROLL GRINDER
1—Lobdell Roll Grinder. Will take roll 24" diameter x 160" face.

ROLLS
315—Table, Dress, Felt, Wire, Breast and Calender Rolls. *Various Sizes.*

SATURATOR
1—Guyton-Cumfer 5 gates.

SAVEALLS
1—A. D. Wood cylinder 48" dia. 60" face.
1—Dorr Company #40 ADKA Saveall 340—440 DPM. Used 1 month.
1—Dorr Company #50 ADKA Saveall 550—680 DPM. Used 1 month.
1—No. 4 Bird with motor and speed reducer 16" diam. rubber couch.

SCREW PRESS
1—Valley Iron Screw Press. Used 2 years.

STOKERS
2—Iron Fireman Pneumatic Spreader Stokers for two—300 h.p. boilers. Complete with undergrates, fans, sly ash fans, weight lory, portable car unloader. All direct connected to motors with starters. Used 1 year.

STUFF PUMPS
1—12" x 12" Goulds triplex.
7—10" x 20" Shartle triplex.
1—8" x 18" Shartle triplex.
1—12" x 16" Shartle triplex.
1—8" x 10" Shartle triplex.
1—7" x 16" Shartle triplex.
1—8" x 18" Shartle duplex.

THICKENER
1—Shartle Bros. Thickener. Cylinder Mold 72" face x 36" diameter with 16" diameter couch.

TRIMMERS
1—65" Oswego Trimmer with motor.
2—56" Smith & Winchester Undercut with motor.

TURBINES
1—Westinghouse Turbine Generator 3125 KVA—600 volts—3 phase—60 cycle—30 lb. back pressure.
1—General Electric Turbine Paper Machine Drive. 250 h.p.—350 r.p.m. 125 lb. steam pressure.

TWISTING MACHINES
1—36 Spindle Brownell Twister with motor.

UNWINDERS
1—52" Johnstone Uniform Tension Unwinder with auto, hydraulic brakes. Used 6 months.
1—42" John Waldron Unwinder. Used 1 year.

VACUUM PUMPS
1—14" x 20" Connersville.
1—12" x 18" Connersville.

WASHERS (Beaters)
1—54" face—45" diam. with rigging.
1—52" face—52" diam. with rigging.

WELL PUMP
1—A. D. Cook 100 g.p.m. 175' head, 70 feet in well 6" drop in pipe—5¾" bronze double acting cylinder. Direct connected to 10 h.p. motor.

YANKEE DRYER
1—Beloit 186" face 12' diameter with Messinger Bearings.

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY

SITUATIONS WANTED

CHIEF CHEMIST of a southern kraft paper and board mill available. Young, aggressive and well experienced in kraft board, paper and pulp manufacture. Familiar with modern equipment and machinery. Can furnish excellent references. Address Box 45-701 care Paper Trade Journal. N-8

MACHINE TENDER—All types of board. 25 years experience. Some experience on Fourdrinier in bag and wrapping. Address Box 45-708 care Paper Trade Journal. N-8

SITUATIONS WANTED

PRACTICAL MASTER MECHANIC desires position. 25 years experience on Cylinder and Fourdrinier Machines. Ability to handle help and get results. References. Address Box 45-718 care Paper Trade Journal. N-22

HIGH CALIBER SALESMAN—Experienced in fine and coarse papers, desires representative connection in Middle West territory for mills or converters with non-competing lines. Address Box 45-720 care Paper Trade Journal. N-8

FOR SALE

FOR SALE
1—Howe dial scale, capacity 2400#
1—Detroit electric hoist, 2 ton type II with trolley with 3 P. 60 Cy, 550 volt motor.
1—American Tachometer
1—100 HP Terry Turbine, 200# pressure, 2000 RPM

SHARTLE BROTHERS MACHINE COMPANY
Middletown, Ohio
N-15

FOR SALE | FOR SALE | FOR SALE

FOR SALE

Several Iron tub beaters used only few months. Rolls 80" diameter x 55" wide. Tubs 38'-4⅝" long inside. Hollow midfeather. Anti-friction bearings. Pulleys 96 x 21. Two washers each. Excellent for straw, rag half stock, clearing up old papers, etc. Drawings available.

SHARTLE BROTHERS MACHINE CO.,
Middletown, Ohio N-22

FOR SALE

80" Waldron 6-Roll Brush Coater & 64" Rewinder
48", 72" Automatic Power Paper Cutters with new knives
32", 40", 52" Single & Double Roll Coaters
14"x22", 26"x38" Thomson & 30"x36" Cottrell Die Cutters.
40", 50", 56" MIEHLE Printers—or can be converted to Die Cutters
18½"x18" Seybold 4-Post Embosser, with Elec. Heat. Attach.
ALSO CREASERS, SLITTERS, GLUERS, BOX STITCHERS, WRAPPERS, ENDERS, CORNER CUTTERS, SLITTERS & REWINDERS—all in many sizes and makes. All offered REBUILT & GUARANTEED. Write for Bulletin No. 124. Listing over 100 Paper & Board Converting Machines—now on our floor.

SOUTH WABASH ENGINEERING CO.
2937 South Wabash Ave.
CHICAGO, ILLINOIS D-20

PAPER MILL & PAPER CONVERTING EQUIPMENT FOR SALE

24" Inman Slitter.
28" Sheridan Automatic Power Paper Cutter.
44" Seybold Holyoke Aut. mill type Power Cutter.
48" White Automatic Power Cutter.
41" Hamblet Sheeter
60" Finley Sheeter.
110" Hamblet heavy duty Sheeter.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machines.
New 62" Two-Roll Back Stand, handling rolls up to 30" diameter.
4 Waldron 56" Paper Reelers
Baling Machines, both hand and power.
40" Type SL Kidder Slitter.

THOMAS W. HALL COMPANY, Inc.
130 West 42nd St., New York 18, N. Y.
TF

FOR SALE

3—Taylor Stiles Giant Rag Cutters.
2—Rotary Sheet Cutters, 1—60" and 1—42" wide. With slitting attachments and 24 roll double deck backstands.
1—56" Undercut Power Paper Cutter.
1—72" Seybold Automatic Knife Grinder.
1—72" Dietz Toilet Paper Perforator.
1—26" Special Dicing or Ribbing Machine.
1—30" Seven Roll Super Calender Stack.
All above machines complete with A.C., 3 phase, 60 cycle, 440 volt motor equipments.
1—44" Oswego Power Paper Cutter with suitable motor equipment, rebuilt and guaranteed.
1—Nashua—Kalamazoo 67" Water Finish Machine and Eliminator for installation in waxing machine. Complete with 15 h.p. A.C. motor.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
TF

FOR SALE—62" Model 6 Cameron Slitter. Address Box 45-719 care Paper Trade Journal. N-15

FOR SALE—38" Oswego Automatic Clamp Cutter, fully rebuilt and guaranteed. Address Box 45-734 care Paper Trade Journal. N-8

REVAMPING AND BUILDING MILL AND CAN OFFER FOR SALE

One large Breaker Beater complete
One small Beater Complete
1—50" Diameter X 90" Face cylinder mold
1—8x8 Shartle Duplex plunger stock pump
1—New pair cast steel double suspension spring type beater bearings for 8" diameter journal —Noble & Wood beater roll. Never used
1—Used old style lighter beam for 8" diameter journal Noble & Wood beater
1—New reinforced design lighter beam for 8" diameter journal—Noble & Wood beater roll. Pattern No. 662. Never used.
3—500 KVA —33000-2300/4000 volts transformers
86—62" Face steel dryer felt rolls—1—7/16" journals
1—20" Face cast iron taper pulley—2 15/16" bore taper 31"x29½"
4—36" diameter x 83" face dryers
1—6" to 10" Cox & Sons Pipe threading machine
1—20" Noble & Wood impeller for circulation beater.
A visit to the mill would prove profitable as we have many items for sale to numerous to mention. See our superintendent Mr. O. P. Fassell at our plant in Walloomsac, New York.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York TF

FOR SALE

36" Diameter Dryers 85" and 86" Face — 3 Deck — Complete with Stands, Gears and Bearings.

EMPIRE BOX CORPORATION
Garfield, New Jersey
TF

FOR SALE

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Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LINTER COTTON
The Railway Supply & Equipt. Co.

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
The Water Associated Oil Co

LUBRICATORS
Wills-McCanna Co.

MATERIAL HANDLING
Northwest Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
H. K. Porter Company
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOISTURE CONTENT CONTROL
Steamaire Company

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOARD
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPERMILL BUILDERS
Merritt Chapman & Scott Corp.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Postdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Stowe-Woodward Inc.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
I. O. Rose Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co
Paper Converting Machine Co., Inc
Postdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc
Gottesman & Co., Inc.
Elof Hansson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PULPSTONES
Norton Company

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Steamaire Company
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

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Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hodson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Rubber Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Sickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
Glidden Corp.
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Rosblen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
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Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
Stowe-Woodward Inc.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Stowe-Woodward Inc.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Postdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Postdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Merey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
Glidden Company, Soya Products Div.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Socony-Vacuum Co.
Stein, Hall & Co., Inc.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Postdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SOLENOID VALVES
Steamaire Company

SPRAY NOZZLES
The Spray Engineering Co.

SPRAYING EQUIPMENT
Steamaire Company

STAINLESS STEEL
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

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STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Company
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
Ansul Chemical Company

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Johnson Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Stowe-Woodward Inc.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Automatic Transportation Co.
Elwell Parker Electric Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnell Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

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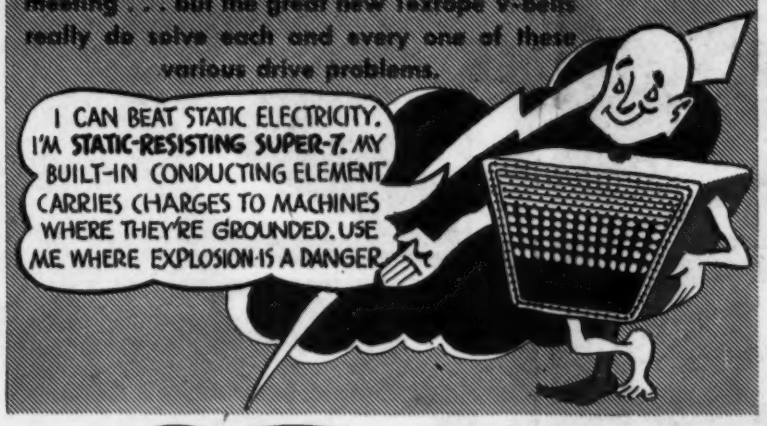
TALL TALES ...but TRUE!

Their exploits may sound like a "Liars Club" meeting . . . but the great new Texrope V-Belts really do solve each and every one of these various drive problems.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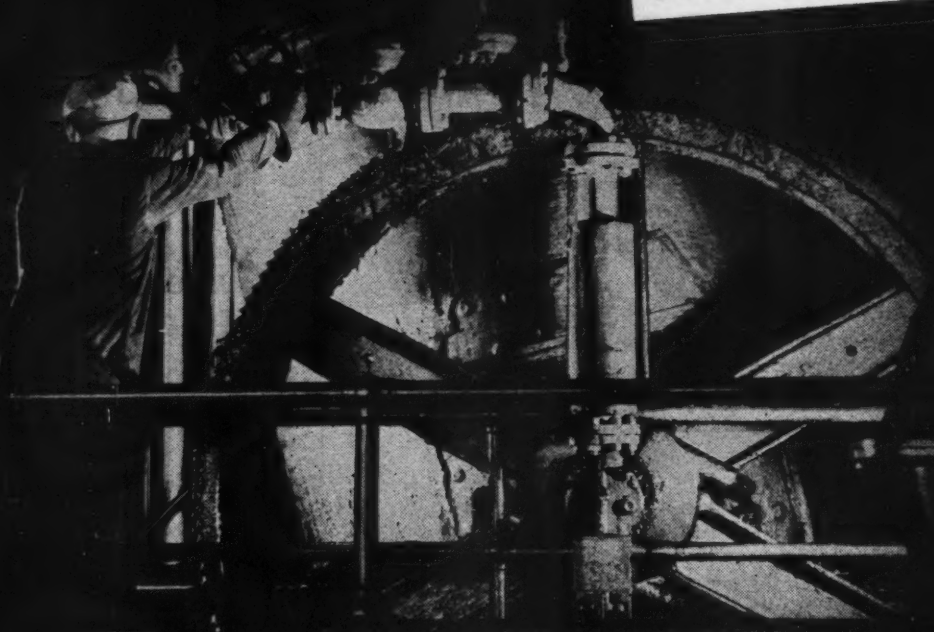

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